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Basic Alternate Route Selection

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BASIC ALTERNATE ROUTE SELECTION

Course 320

Training purposes Only

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COURSE INTRODUCTION

OVERVIEW

This course is designed for support personnel who are responsible for provisioning, maintaining, interpreting, and revising a Basic Alternate Route Selection (BARS) database. The BARS feature allows outgoing calls to be automatically routed over the most cost-effective trunk facility available at the time of the call.

This course provides the student with:

- An overview of the BARS-related feature descriptions, operations and applications;
- Instruction on the steps required to provision the BARS-related features;
- Interpretation exercises that reinforce the information presented in all course sections;
- Practical exercises in which students will perform specific feature administration tasks;
- A comprehensive practical exercise in which the student will provision a BARS database to satisfy a specific customer's needs;

OBJECTIVE(S)

A customer calls and puts in a work order for a new BARS database to be installed in their Meridian 1 system with very detailed specifications throughout the organization. Another customer has requested that certain changes be made to their system routing requirements, and a third customer has requested that certain employees in your company not be allowed to make calls to specified telephone numbers during certain times of the day or week.

As a field technician, System Design Specialist, or system administrator, you must be able to provision a BARS database. You must be able to interpret the trunk types as well as the dialing requirements, and you must be able to interpret the components of the BARS feature. You must also be able to interpret and provision the BARS access code, digit translation, digit restriction and recognition, trunk group exclusion, least cost routing, time of day, digit

manipulation, area screening, class of service, routing control, queuing and authorization codes. Once you have learned the different features and services of BARS, you must be able to trace a call through BARS software. As a field technician, you will be required to accomplish the tasks indicated above with complete accuracy.

PREREQUISITES

Course 200 Meridian 1 (Options 21E-81) Familiarization

Course 300 X11 Feature Administration

PERFORMANCE EVALUATION

PRACTICE EXERCISES

Practice exercises are used throughout this course as learning activities. Your participation in the exercises will be noted by the instructor as either satisfactory or unsatisfactory.

EXAMS

Two written exams will be administered by the instructor. These exams contain multiple choice questions, interpretation questions, and provisioning exercises. A minimum average of 70% on both exams is required for course completion.

AGENDA

DAY ONE

- Course Introduction
- Module 1 - Trunk Types and Dialing Requirements
- Module 2 - BARS Overview
- Module 3 - BARS Access Code

DAY TWO

- Module 4 - Digit Translation
- Module 5 - Supplemental Digit Restriction
- Module 6 - Supplemental Digit Recognition

DAY THREE

- Module 7 - Incoming Trunk Group Exclusion
- Module 8 - Automatic Least Cost Routing

DAY FOUR

- Module 9 - Time of Day Schedules
- Module 10 - Digit Manipulation Tables
- Module 11 - Free Calling Area Screening

DAY FIVE

- Module 12 - Network Class of Service
- Module 13 - Routing Control
- Exam 1

DAY SIX

- Module 14 - Off-Hook Queuing
- Module 15 - Call Back Queuing

DAY SEVEN

- Module 16 - Basic Authorization Code
- Module 17 - BARS Interactions with Non-BARS Features
- Module 18 - Call Tracing

DAY EIGHT

- Module 19 - Implementing a New BARS Database
- Implementing a New BARS Database (Final)
- Final Exam

MODULE 1 DESCRIBING TRUNK TYPES AND DIALING REQUIREMENTS

INTRODUCTION

BARS allows outgoing calls to be automatically routed over the most cost-effective facility available at the time of the call. This module describes the various types of trunks that may be used with BARS software and the dialing requirements of each type. This module will also show examples of how each type works.

OBJECTIVES

Given the student guide and class notes, the student should be able to:

- List and define the various trunk types that may be used with BARS.
- Identify the components of a standard telephone number.
- Identify typical components for NPA, NXX, and SPN.
- Identify dialing requirements for FEX, WATS, OCC, COT, T1, and TIE trunks.

DIALING REQUIREMENTS

It is important that you understand the dialing requirements of a standard telephone number, and its relationship to the BARS feature dialing requirements. Whether you're dialing a standard telephone number through direct access or dialing a telephone number through the BARS software, you will better understand how the telephone numbers you dial interact with the BARS feature to provide the most cost-effective routing.

STANDARD TELEPHONE NUMBER

The basic components of a standard telephone number listed below will assist you in better understanding a standard telephone number:

(1)+NPA+NXX+XXXX
↳ AREA CODE

The digit "1" before a long distance number may or may not be required.

NPA - Numbering Plan Area (Area Code) NYX

N = 2-9

P = 0 or 1 (or 0-9 for Release 19+ to support the NANP)

A = 0-9

NXX* - Local Exchange

NXX

N = 2-9

X = 0-9

XXXX - Station Code or direct number

X = 0-9

*NNX is another term for NXX, and is generally used to refer to office codes in areas where 0 and 1 are not used as the second digit

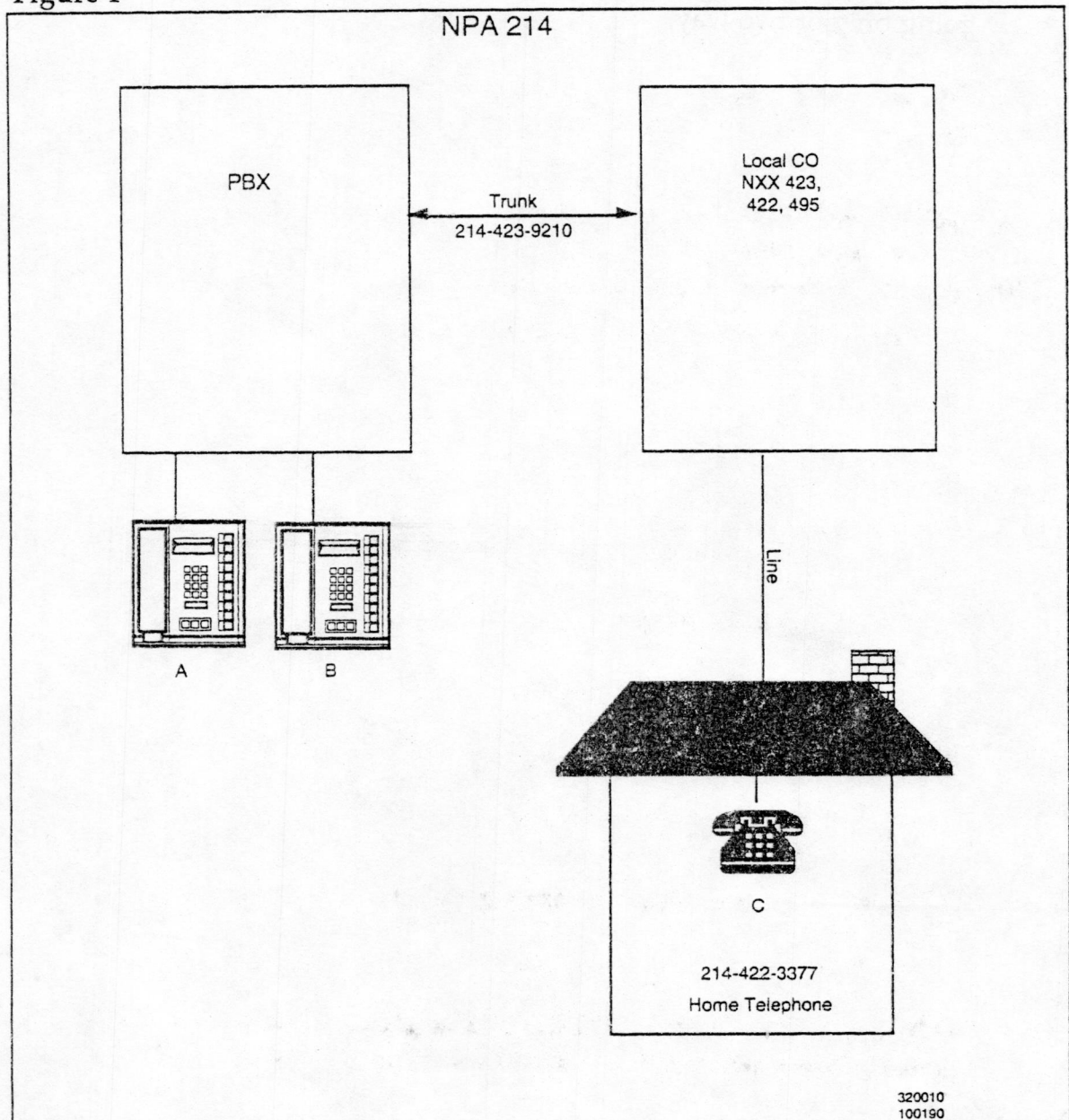
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TRUNK VS. LINE

A trunk is a single circuit between two points, both of which are switching centers or individual distribution points.

A line is a single circuit between two points, one of which is the switching center and the other is the end user.

Trunk and Line Connection
Figure 1



TRUNK DIFFERENCES

Different trunks have different functions. It is important to understand these functions to know which trunks are appropriate for a given call.

CENTRAL OFFICE TRUNKS (COT)

CO trunks provide unlimited access to the world. A station user may call anywhere using a CO trunk. COTs may be incoming only, outgoing only or two-way.

DIALING REQUIREMENTS COT

The standard dialing requirements for calls placed over CO trunks are:

<u>TYPE OF CALL</u>	<u>DIGITS REQUIRED</u>
Local	NXX+XXXX
Long distance within Home NPA (toll)	(1)+HNPA+NXX+XXXX or (1)+NXX+XXXX
Long Distance (Direct Distant Dial - DDD)	(1)+NPA+NXX+XXXX
Operator Assisted (DDD)	0+NPA+NXX+XXXX
International DDD	011+CC+NN
Operator Assisted International	01+CC+NN
Outside Operator	0
Information	(1)+411 or (1)+555+1212 or (1)+NPA+555+1212
Emergency	911 (where available). Check your local telephone company.
Repair	611 (where available). Check your local telephone company.
Toll Free Numbers	(1)+800+NXX+XXXX
Pay Per Call Numbers	(1)+900+NXX+XXXX or 976+XXXX

Depending on point of origin, the (1) may not be required.

WIDE AREA TELEPHONE SERVICE (WATS)

WATS trunks enable a customer to make long distance calls typically at a lower cost than COTs. WATS trunks can be purchased in "bands" through your local telephone company or through your long distance company. A Band defines the geographical calling area of a WATS trunk. A WATS trunk may be either outgoing only or incoming only.

WATS BANDS PARAMETERS

WATS trunks come in bands numbered from 0-5 in the United States.

Band 0 is generally used for intrastate long distance calls. (Exceptions: Illinois uses Band 9; California has 2 intrastate Bands, plus Band 0.)

Band 8 is used for intrastate intra-lata service.

Bands 1-5 are for interstate long distance calls within the continental United States.

Band 5 covers Alaska, Hawaii, Puerto Rico, and the U.S. Virgin Islands, as well as the continental United States.

The higher the band number, the greater the geographical area the band covers.

Each Band covers an area (including the calling area of the lower Bands) with the exception of intrastate bands.

WATS ACCESS VIA COTS

WATS type calls can also be made via Central Office Trunks.

- Company subscribes to service and pays a monthly charge.
- Calls are billed on a per minute (or six second (6s) increments) basis. Price per minute or 6s varies depending on area called.
- Some international calls can also be routed through this service.
- May also include intrastate calling.
- Each vendor uses a different name when referring to this service (i.e., MCI uses Prism; AT&T uses Pro-America).

DIGIT REQUIREMENTS WATS

The standard digit requirements for calls placed over WATS trunks are:

<u>TYPE OF CALL</u>	<u>DIGITS REQUIRED</u>
Long Distance (DDD)	(1)+NPA+NXX+XXXX
Operator Assisted (DDD)	0+NPA+NXX+XXXX
Long Distance within Home NPA (toll)	(1)+HNPA+NXX+XXXX or (1)+NXX+XXXX

FOREIGN EXCHANGE (FEX)

FEX trunks connect a PBX to a telephone company central office other than the one that normally serves the PBX's area. FEXs may be incoming only, outgoing only or two-way. Unless the serving area is restricted in the database of the PBX, FEXs may be used to call anywhere in the world.

DIGIT REQUIREMENTS FEX

The standard digit requirements for calls placed over FEX trunks are:

<u>TYPE OF CALL</u>	<u>DIGITS REQUIRED</u>
Local to FEXs (within home NPA)	NXX+XXXX

TIE

TIE trunks connect two PBXs. TIE trunks may be incoming only, outgoing only or two-way. Unless restricted in the database of the PBX on the terminating end, a TIE trunk may be used to access any of the terminating PBX's outgoing facilities.

DIGIT REQUIREMENTS TIE

The standard digit requirements for calls placed over TIE trunks are:

<u>TYPE OF CALL</u>	<u>DIGITS REQUIRED</u>
Station to station	XXXX
Local to distant PBX's HNPA	NXX+XXXX

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DIRECT INWARD DIAL (DID)

DID calls ring directly on the dialed station. DID trunks are incoming only. For this reason, they have nothing to do with routing a call out through BARS.

OTHER COMMON CARRIER (OCC)

OCC service is provided by companies other than the serving telephone company. OCC service enables a customer to make long distance calls typically at a lower cost than COTs.

OCCs provide the following types of service:

- Feature Group A - Dial-Up Service. OCC dial-up service uses local Central Office trunks to access the OCC's network. OCC networks may cover most of the United States. They do not necessarily serve every exchange in a given area code or are not cost-effective for every exchange within a given area code. This group does not provide answer supervision.
- Feature Group B - uses local Central Office trunks to access the OCC's network. An OCC user will access the OCC network by dialing 950-WXXX where W is 0 or 1 and XXX is a code identifying the carrier. This group provides answer supervision.
- Feature Group D - full equal access. Feature Group D uses local Central Office trunks to access the OCC's network. A user will presubscribe to OCC service and all long distance calls via COTs will be routed to the OCC network
- DAL - Dedicated Access Lines - uses a direct connection (TIE trunks) between a PBX and the OCC network.

DIGIT REQUIREMENTS OCC FEATURE GROUP A

The standard digit requirements for calls placed over CO trunks to OCC are:

1. The user must first dial the local OCC telephone number - AC+NXX+XXXX
2. The user waits until a tone is received from OCC network
3. The user enters the required authorization codes - XX. .XX

CALL TYPE

DIGITS REQUIRED

Long distance (DDD)

(1) + NPA + NXX + XXXX

Long distance within
Home NPA (toll)

(1) + HNPA + NXX + XXXX
or (1) + NXX + XXXX

DIGIT REQUIREMENTS OCC FEATURE GROUP B

The standard requirements for calls placed over CO trunks to OCC are:

The user must dial carrier code - AC+950+WXXX

W = 0 or 1

XXX = 0-9 (identifies carrier)

CALL TYPE

DIGITS REQUIRED

Long distance (DDD)

(1) + NPA + NXX + XXXX

Long distance within
Home NPA (toll)

(1) + HNPA + NXX + XXXX
or (1) + NXX + XXXX

DIGIT REQUIREMENTS OCC FEATURE GROUP D

The standard digit requirements for calls placed over CO trunks to OCC are:

<u>CALL TYPE</u>	<u>DIGITS REQUIRED</u>
Long distance (DDD)	(1)+NPA+NXX+XXXX
Long distance within Home NPA (toll)	1)+HNPA+NXX+XXXX or (1)+NXX+XXXX

DIGIT REQUIREMENTS OCC DAL

The standard digit requirements for calls placed over dedicated TIE trunks to OCC are:

Long distance (DDD)	(1)+NPA+NXX+XXXX
Long distance within Home NPA (toll)	(1)+HNPA+NXX+XXXX or (1)+NXX+XXXX

TRUNK ROUTE COST EFFECTIVENESS

The different types of trunks vary in cost effectiveness. The normal order of cost effectiveness from least expensive to most expensive is:

TIE

FEX

OCC

WATS

COT

This order may vary by time of day, local telephone company tariffs and usage.

SUMMARY

In this lesson, you learned that both a trunk and a line are single circuits between two points. They are distinguished by the fact that a trunk's two points can be switching centers or distribution points, and a line's two points require a switching center and an end user. You can now distinguish the differences between the various trunks known as:

Central Office Trunk (COT)

Wide Area Telephone Service (WATS)

Foreign Exchange (FEX)

TIE

Direct Inward Dial (DID)

Other Common Carriers (OCC)

This lesson also discussed how the dialing requirements relate to the carrier's dialing requirements.

MODULE 2

BARS OVERVIEW

INTRODUCTION

This module will describe the BARS feature in detail. It will also provide the step by step procedures BARS will follow to complete a call. On the following page you will find a customer scenario of Miles Imports Ltd. explaining the BARS software process in determining the least expensive route for a call.

OBJECTIVES

Given the Student Guide and class notes, the student should be able to:

- Identify how a call is processed through the BARS software.
- Interpret the language associated with the BARS feature.

Miles Imports LTD Example

Miles Imports LTD of Budd Lake, NJ would like to make a call to (212) 344-5700. An access code of 7 is assigned to their system, and they are required to dial "1" before a long distance number. The Miles Imports' switch has been provisioned with the COT, OCC, Band 0-WATS, Band 3-WATS, Band 5-WATS, FEX to NPA 212 and FEX to NPA 307. The software will ask the following questions to determine if the call can be completed through the Miles Imports LTD Meridian 1 switch:

- Can calls to NPA 1212 be processed through BARS? (Network Translation)
- Are any calls within NPA 1212 to be denied or recognized? (SDRR) TABLA DE RESTRICCIONES
- Over which facilities should this call be sent? Which is the most cost-effective? (Route List)
- Which facilities are preferable for completing this call? (ISET)
- Are all route choices for this call "turned on"? (TODS)
- Can only certain facilities serve this NXX? (FCAS)
- With which network access characteristic is this user associated? (NCOS)
- Is a different set of network access characteristics in effect for this user at the time indicated? (Routing Control)
- Of the facilities over which the call may be completed, for which is the user eligible? (FRL)
- If all eligible facilities are currently busy, can the user remain off-hook? (OHQ)
- If all eligible facilities are currently busy, can the user activate Ring Again? (CBQ) CALL BACK QUEING
- Which are the less preferable facilities for completing this call? (ESET)
- Will a caller know if a route is "expensive"? (ERWT)
- Do digits dialed match digits to be outpulsed, or are insertions/deletions required? (DMI)

HOW BARS WORKS

The following eight steps will explain how a call is processed through BARS software. The understanding of this process will assist you throughout the course.

1. The user dials the BARS access code and desired number.
2. The Central Processing Unit (CPU) locates the digits dialed by the user in the network translation table (translate from one to eleven digits).
 - The table lists all NPAs, all NXXs within the home NPA, and all special numbers (SPNs). (A special number is a digit sequence that does not conform to standard NPA or NXX format, e.g., 011.)
 - The table contains a pointer that tells the CPU over which group of trunks to complete the call (route list index will be referenced). R L I
 - The table references the Supplemental Digit Restriction/Recognition blocks to determine what digits will be restricted/recognized in a particular route list.
3. The CPU locates the route list index associated with the digits dialed.
 - Trunk routes are referred to as entries in the route list index and listed from least expensive (entry 0) to most expensive (last entry in route list).
 - Each entry has information to complete the call (such as, Time of Day, Facility Restriction Level, Free Calling Index, Off-Hook Queue & Call Back Queue).
 - Trunk route number
 - Digit manipulation table to be used to ensure that the digits outpulsed match the dialing requirements of the trunk type
4. The CPU will attempt to complete the call over the first entry:
 - An entry must pass eligibility requirements (TOD, FCI, FRL) to complete over the route list entry
 - If the first entry is not eligible or available, the CPU will examine the next entry.

5. The CPU will continue to search for an eligible, available entry until all inexpensive routes have been checked.
6. If eligible, the CPU will attempt to complete the call over a route classified as "expensive". Before placing a call over such a route, the CPU may alert the user that the call is about to be placed over an "expensive" route (Expensive Route Warning Tone).
7. If no idle, eligible trunks are found, the CPU may also offer the user the opportunity to wait in queue for an available "inexpensive" trunk.
 - If allowed, the user hears a burst of tone and may remain off-hook while waiting for trunk to become idle (Off Hook Queue); or
 - If allowed, a station user hears overflow tone possibly preceded by a Recorded Announcement, and activates Ring Again (Call Back Queue).
8. If allowed, after a programmable time limit is reached, the CPU may complete the call over an "expensive" route.

NARS VS. BARS

NARS - Network Alternate Route Selection

NARS was developed to handle the increasing need of businesses to have facilities tied together to create a private telecommunication network. NARS software will perform least cost routing for multiple switches (in addition to other features and services). As of Release 18, all switches come equipped with NARS in the base system software.

BARS - Basic Alternate Route Selection

BARS software was derived from NARS software. BARS software is usually programmed to perform least cost routing for one location. BARS software will be the only software taught in this course.

BARS TERMINOLOGY

To gain an understanding of the BARS feature, it is necessary to become familiar with the terminology associated with BARS. The terms indicated below are put in a pre-determined order to help you better understand how a call is processed through the BARS software. The most important terms associated with BARS are:

Call Back Queuing (CBO) - Queuing in which the caller activates Ring Again and goes on-hook until the call can be completed. The switch will notify the user via the Ring Again feature when a trunk becomes available (LD 86).

Digit Manipulation Table (DMI) - A data structure identifying digit insertions and deletions that must be performed before a call can be outpulsed. Deletions are performed first. (LD 86).

Expensive Route Warning Tone (ERWT) Three bursts of tone given to the caller to indicate the call is about to be routed on a trunk route classified as expensive (LD 86, 87).

* Extended Set (ESET)- All entries in Route List index not included in Initial Set (LD 86).

Facility Restriction Level (FRL) - A number from 0 to 7 associated with the NCOS of a station that identifies the outgoing entries available to a call (LD 87).

Free Calling Area Screening Table (FCAS) - A data structure that provides a means of allowing or denying an NPA+NXX on a specific route list entry (LD 87).

* Initial Set (ISET) - Those entries in a Route List index over which the Meridian 1 will attempt to complete a call before testing for queue eligibility (LD 86).

Network Class of Service (NCOS) - A BARS feature that limits access to an RLI entry, specifies queue treatment, and determines eligibility for Expensive Route Warning Tone (LD 87).

Network Translation Table (NET) - A data block that associates the access code and first one (1) to eleven (11) digits of a dialed number with a Route List (LD 90).

Off-Hook Queuing (OHQ) - Queuing in which the station user remains off hook until a trunk becomes idle or a timer expires (LD 86). *see manual for details*

Route List (RLB)- A group of outgoing routes listed in the order they are to be searched by the switch when completing a call. Listing should be from least expensive to most expensive (LD 86).

Routing Control (RTCL) - Provides a mechanism for changing a user's NCOS when a special Time-of-Day Schedule is in effect (LD 86).

Supplemental Digit Restriction and Recognition (SDRR) - A data structure, located in the Translation Table, that defines which sequences of digits are to be denied or recognized (LD 90).

Time-of-Day Schedule (TODS) - A schedule consisting of 1 or more time periods of the 24-hour day during which the entries in a Route List may be turned on or off (LD 86).

BARS FEATURE PACKAGES AND DEPENDENCIES

Several software packages work together to provide the BARS features.

BARS (Opt. 57)

Governs the interaction of the various software packages involved in the BARS database and provides seven of the nine BARS services indicated below and numbered 1-9:

1. BARS Access Code
2. Digit Translation
3. Supplemental Digit Restriction/Recognition
4. Time-of-Day Schedule
5. Digit Manipulation
6. Free Calling Area Screening
7. Routing Control

BRTE (Opt. 14)

Automatically selects the least expensive route for a call. The service that makes up the BRTE package is:

8. Automatic Least-Cost Routing

NCOS (Opt. 32)

9. NCOS has 3 functions:
 - Limits the outgoing trunk routes available to a given station user.
 - Specifies whether Call Back Queuing or Off-Hook Queuing is allowed for a given station user.
 - Specifies whether a station user will hear the Expensive Route Warning Tone (ERWT).
- NCOS is the service that makes up the NCOS package.

SUMMARY

In this lesson, you learned how a call was processed through the BARS feature by an eight-step process. You also discovered the difference between Basic Alternate Route Selection (BARS) and Network Alternate Route Selection (NARS). BARS software was derived from NARS software, and is usually programmed for one location to perform least cost routing. NARS software was derived to tie several facilities together to perform least cost routing.

You gained an understanding of the BARS feature through its terminology such as:

- Network Translation Table (NET)
- Supplemental Digit Restriction and Recognition (SDRR)
- Route List (RLB)
- Initial Set (ISET)
- Extended Set (ESET)
- Expensive Route Warning Tone (ERWT)
- Time-of-Day Schedule (TODS)
- Digit Manipulation Table (DMI)
- Free Calling Area Screening Table (FCAS)
- Network Class of Service (NCOS)
- Facility Restriction Level (FRL)
- Routing Control (RTCL)
- Off-Hook Queuing (OHQ)
- Call Back Queuing (CBQ)

Finally, you became familiar with the BARS feature packages and their dependencies to understand the needs of a system to perform the various tasks associated with BARS.

BQUE (Opt. 28)

Provides basic queuing capability.

FCBQ (Opt. 61)

Queuing in which the caller activates Ring Again and goes on-hook until the call can be completed. CBQ notifies the station user via Ring Again when a trunk becomes available.

PQUE (Opt. 60)

Allows callers to queue against busy trunk routes according to assigned priority levels.

OHQ (Opt. 62)

Allows a station user to remain off-hook and wait for a trunk to become available.

Bars Feature Packages and Dependencies Chart
Figure 1

BARS FEATURE PACKAGES AND DEPENDENCIES

<u>Governing Package</u>	<u>Dependencies</u>
BARS	BRTE NCOS
FCBQ	BQUE BARS
CHQ	BQUE BARS
PQUE	NCOS

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100290

MODULE 3

THE BARS ACCESS CODE

INTRODUCTION

Outside calls are made by dialing the BARS Access Code followed by the desired number. This code triggers the BARS software to perform the call processing and routing required for call completion. The following page shows an example of how the BARS access code processes through BARS, and how BARS can be bypassed to access a trunk directly.

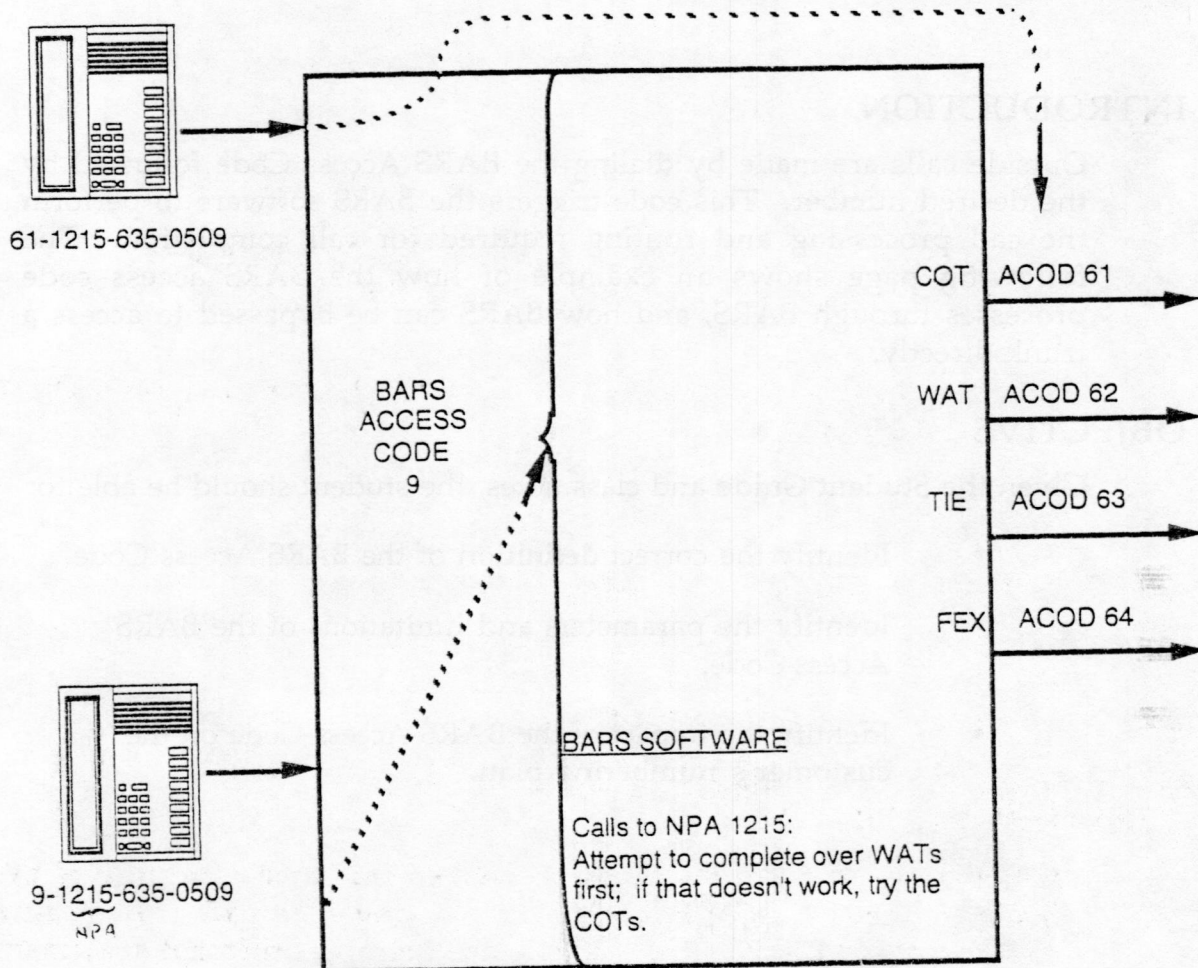
OBJECTIVE

Given the Student Guide and class notes, the student should be able to:

- Identify the correct definition of the BARS Access Code.
- Identify the parameters and limitations of the BARS Access Code.
- Identify the impact of the BARS Access Code on the customer's numbering plan.

GK Glass Products Inc.
Prior to provisioning ACOD
Figure 1

GK GLASS PRODUCTS INC.
(BOSTON)



NUMBERING PLAN:

0 = ATTENDANT	5XXX = DNs	8 =
1 = SPRE	61 = COT; 62 = WATS;	9 = BARS
2XXX = DID DNs	63 = TIE; 64 = FEX;	ACCESS
3XXX = DID DNs	65 = DID	CODE
4 = PAGING	7XXX = DNs	

320009
092890

DEFINITION

Outgoing calls from a Meridian 1 equipped with BARS software are made by dialing the BARS access code (AC1) followed by the desired number. Dialing the BARS access code (AC1) triggers the BARS software to perform the call-processing and routing required for call completion.

PARAMETERS

The BARS access code (AC1) may be a one- or two-digit number.

The BARS access code (AC1) is usually 9, but may be any one or two-digit number that does not conflict with the customer's numbering plan.

Dial tone may be provided to the user after the BARS access code is dialed (Dial Tone Option).

LIMITATION

There may be no conflict between the BARS access code and any other part of the customer's numbering plan.

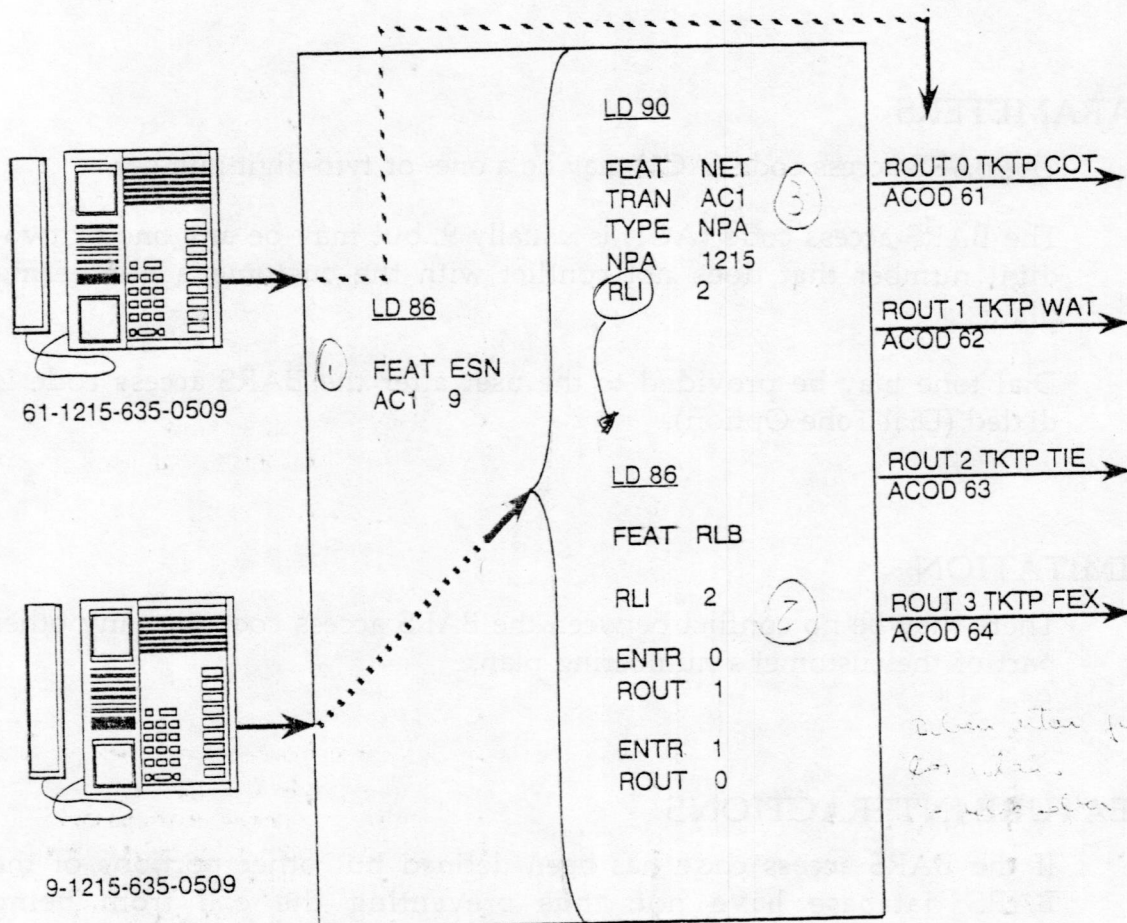
FEATURE INTERACTIONS

If the BARS access code has been defined but other portions of the BARS database have not, thus preventing the call from being completed through BARS, the user will receive intercept treatment (overflow tone, recorded announcement, or route to the attendant).

PROVISIONING THE BARS ACCESS CODE

GK Glass Products Inc.
AC1 provisioned
Figure 2

GK GLASS PRODUCTS INC.
(BOSTON)



Numbering Plan:

0 = Attendant
1 = SPRE
2XXX = DID DNs
3XXX = DID DNs
4 = Paging

5XXX = DNs
61 = COT; 62 = WATS;
63 = TIE; 64 = FEX;
65 = DID
7XXX = DNs

8 =
9 = BARS
Access
Code

2 to 3 lines to main
BARS: Enter the lines to main a new line RLB

320097
102690

Network Intercept Treatment Chart
Figure 2

Network Intercept Treatment

PADA CAMBIAR 2* 2 L
LD 15
REVISAR LD 21
CUSTOMER DATA BLOCK

() DEFAULT

	Station or DISA	Attendant-Extended or Originated	Tie Trunk	DID	
NINV	(OVF) ATN RAN	(OVF) ATN RAN	(OVF) ATN RAN	OVF (ATN) RAN	No translation table No Network Control data block
NITR	(OVF) ATN RAN	(OVF) ATN RAN	(OVF) ATN RAN	OVF (ATN) RAN	Digit sequence dialed is not in translation table
NRES	(OVF) ATN RAN	(OVF) ATN RAN	(OVF) ATN RAN	OVF (ATN) RAN	Initial digit sequence located in translation table, but subsequent digit sequence blocked via SDRR
NBLK	(OVF) ATN RAN	(OVF) ATN RAN	(OVF) ATN RAN	OVF (ATN) RAN	Call blocked via: • All trunks busy • TOD • FCI • FRL

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SUMMARY

The BARS Access Code is also referred to as "AC1". This lesson defined an access code as a service of the BARS feature that allows outgoing calls from a Meridian 1 equipped with BARS software to be made by dialing an access code (AC1). This access code triggers the BARS software to perform the call processing and routing required for call completion. You also learned how to provision AC1 by interpreting the parameters, limitations and feature interactions.

Additionally, you learned how to provision the Dial Tone option, and you learned how it interacted with AC1. After interpreting and provisioning the BARS access code in this lesson, you were required to determine the intercept treatment if AC1 is defined but neither the Network Translation nor the Network Control Data Blocks are built. After determining the appropriate intercept treatment, you learned how to provision it in the Customer Data Block.

MODULE 4

DIGIT TRANSLATION

INTRODUCTION

This module describes how the Meridian 1 performs Digit Translation once it has recognized the BARS Access Code. The example on the following page explains how the BARS software uses Digit Translation to route a call through BARS.

OBJECTIVE

Given the student Guide and class note, the student should be able to:

- Identify the correct definition of Network Translation.
- List the four types of Network Translation.
- Identify the parameters and limitations of Network Translation.
- List the three possible intercept treatments for calls blocked during Network Translation.

DEFINITION

Digit Translation is the process within BARS that identifies the NPA, NXX, SPN or HNPA dialed by the station user and determines over which route list the call is to be routed.

PARAMETERS

There are four types of digit translation: NPA, SPN, NXX and HNPA.

21221421

LIMITATIONS

There cannot be identical NPAs, SPNs, NXXs or HNPAs assigned.

Numbers must be unique from the left when reading the number.

SPN - 56

57

32

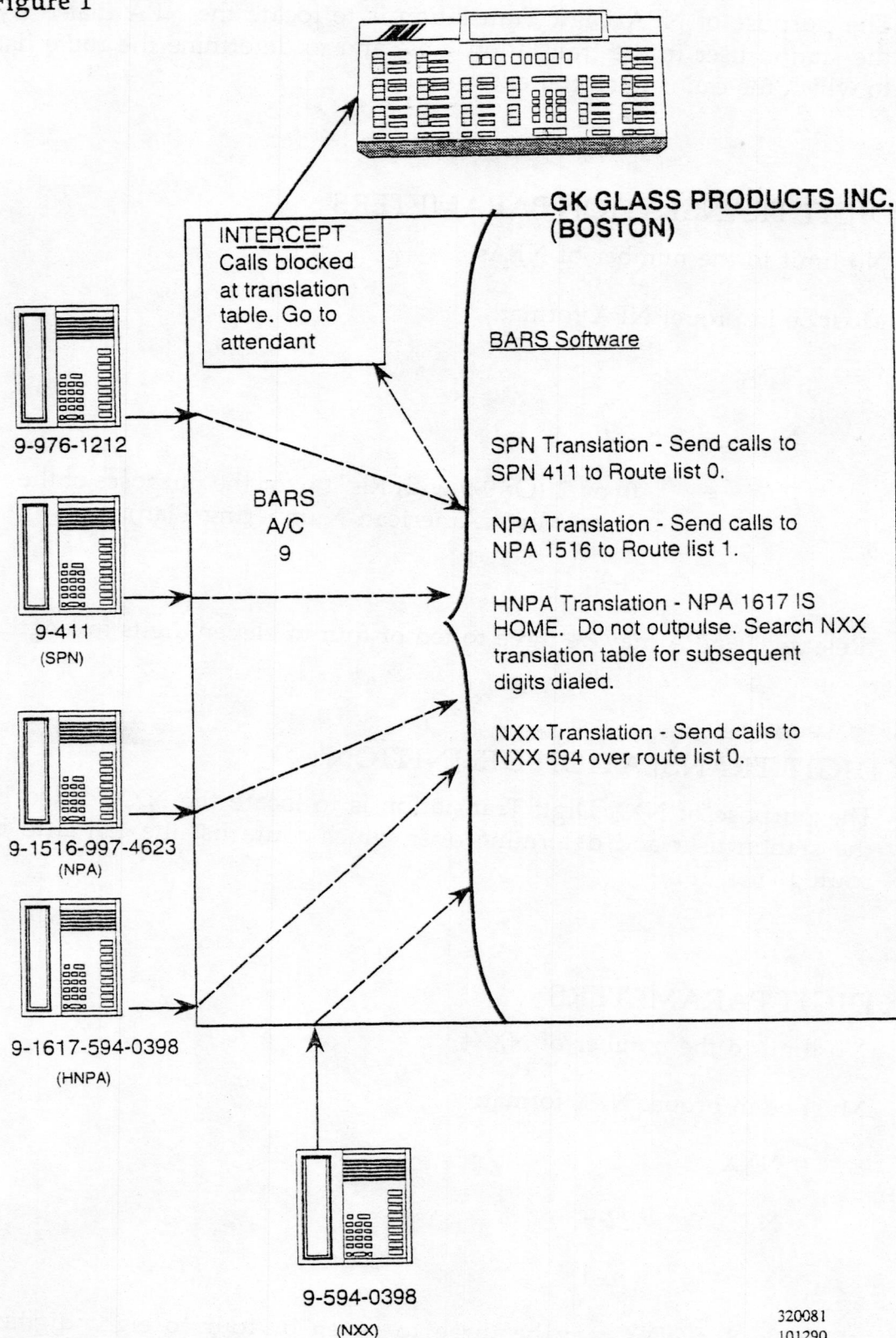
→ # 3' identifies to central.

NXX 256

SPN → Acceptor 3 digits

NPA → " 4 "

Digit Translation Interpretation Chart
Figure 1



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NPA DIGIT TRANSLATION DEFINITION

The purpose of NPA Digit Translation is to locate the NPA dialed by the station user in the translation table and to determine the route list to which the call is to be routed.

NPA DIGIT TRANSLATION PARAMETERS

No limit to the number of NPAs

Must be in proper NPA format:

NPA

N = 2-9

P = 0 or 1 (Or 0-9, with Rls. 19, for the purposes of the New North American Numbering Plan).

A - 0-9

*Release 8 - NPA may be three to ten or four to eleven digits in length.

NXX DIGIT TRANSLATION DEFINITION

The purpose of NXX Digit Translation is to locate the NXX dialed by the station user and determine over which route list the call is to be routed.

NXX DIGIT PARAMETERS

No limit to the number of NXXs.

Must be in proper NXX format:

NXX

N = 2-9

X = 0-9

*Release 8 = NXX may be three to seven or four to eight digits in length.

Module 4

SPN DIGIT TRANSLATION DEFINITION

The purpose of SPN Digit Translation is to allow the station user in the translation table area to specify which the call is to be routed.

SPN	RCE
00	1
02	0
03	0
05	0
06	0
07	0
09	1
1	0
9	0

SPN DIGIT TRANSLATION PARAMETERS

- No limit to the number of SPNs.
- May be any combination of digits.
- Release 4 to Release 7 - SPN may be one to four digits in length.
- Release 8 - SPN may be one to eleven digits in length.

FLEXIBLE ESN "0" ROUTING

When an SPN is encountered, a special check is made to determine if a "0" was dialed. If "0" had been dialed, the system waits for the next one or two digits (or end of dialing indication). After the system has received the digits, it proceeds to the data block to look up the appropriate Route List Index (RLI). The system will direct the call to the Route List Index and proceed with call processing.

This feature allows a few predefined, non-leftwise unique, dialing sequences to be entered in a translation table. "Leftwise unique" means that each entry cannot match the leftmost portion of any other entry in the table. For example, if "456" is an entry in the table, no other entry may begin with "456."

The ESN translation table will allow any or all of the following non-leftwise unique numbers (along with their associated route list) to be entered into the ESN translation table:

- 0
- 00
- 01
- 011

HOME NPA DIGIT TRANSLATION DEFINITION

The purpose of HNPA Digit translation is to locate the HNPA dialed by the station user in the translation table. The system will delete the HNPA, locate the NXX dialed by the station user in the translation table and determine the route list over which the call is to be routed.

HOME NPA DIGIT TRANSLATION PARAMETERS

Only one home NPA can be defined.

Most commonly used in areas that do not require the home NPA for toll calls.

(1)NPA + NXX + XXXX (HNPA will automatically be deleted from dialed digit sequence).HNPA or 1 + HNPA

An HNPA may be three or four digits in length.

DIGIT TRANSLATION INTERACTIONS

If a station user dials a number not defined in digit translation, the station user will receive one of three customer-defined intercept treatments:

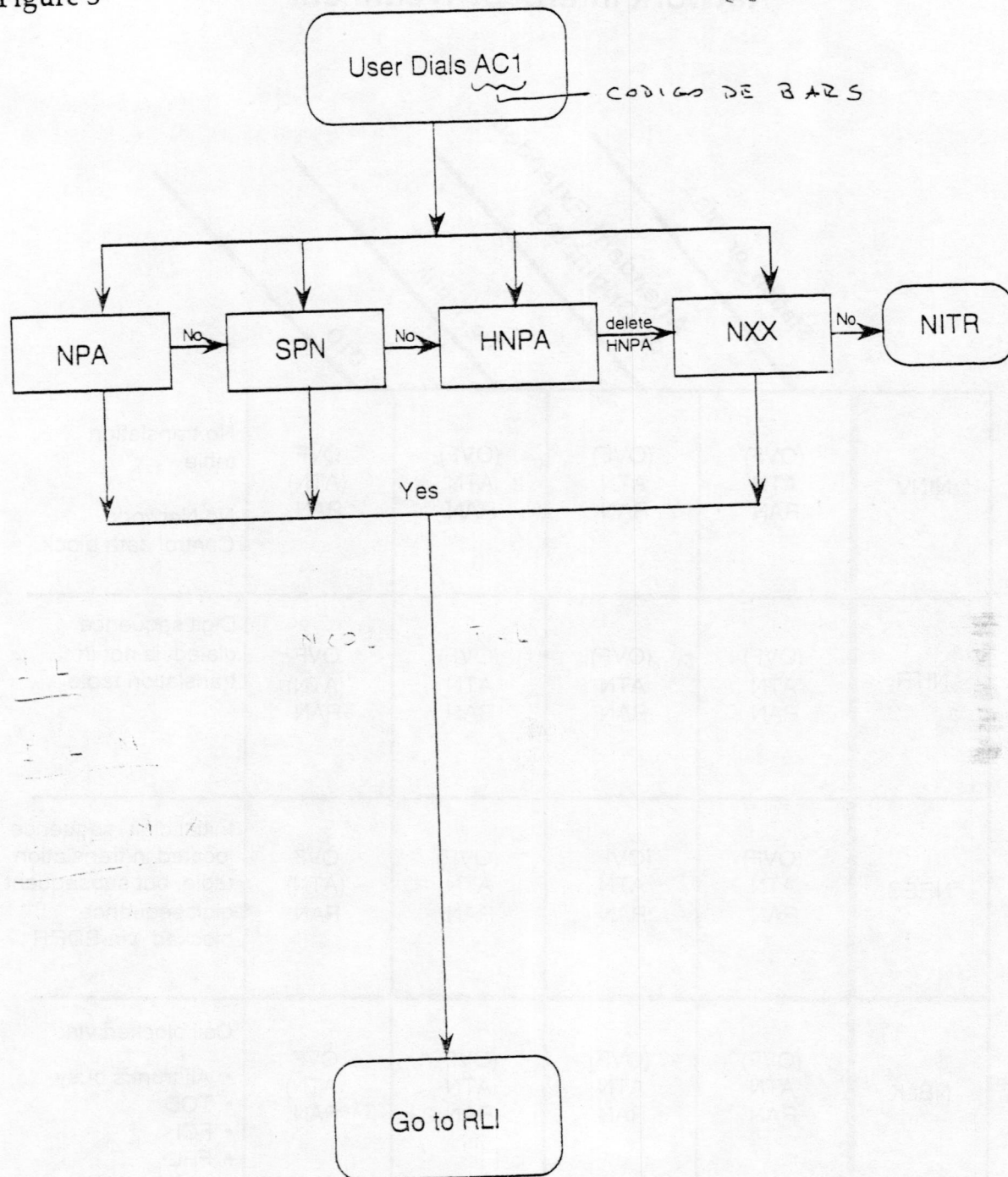
- MESSAGE → RAN - If a station user dials a number not defined in network translation, the user will hear a recorded announcement.
- ENROUTE A LA → ATN - If a station user dials a number not defined in network translation, the user will be routed to the attendant.
- CONSOLA → OVF - If a station user dials a number not defined in network translation, the user will hear overflow tone.

Figure 2

Network Intercept Treatment

	Station or DISA	Attendant-Extended or Originated	Tie Trunk	DID	
NINV	(OVF) ATN RAN	(OVF) ATN RAN	(OVF) ATN RAN	OVF (ATN) RAN	No translation table No Network Control data block
NITR	(OVF) ATN RAN	(OVF) ATN RAN	(OVF) ATN RAN	OVF (ATN) RAN	Digit sequence dialed is not in translation table
NRES	(OVF) ATN RAN	(OVF) ATN RAN	(OVF) ATN RAN	OVF (ATN) RAN	Initial digit sequence located in translation table, but subsequent digit sequence blocked via SDRR
NBLK	(OVF) ATN RAN	(OVF) ATN RAN	(OVF) ATN RAN	OVF (ATN) RAN	Call blocked via: • All trunks busy • TOD • FCI • FRL

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BARS Flowchart
Figure 3320065
100590



SUMMARY

This lesson examined Digit Translation in detail. You learned that Digit Translation is the process that identifies the NPA, NXX, SPN or HNPA dialed by the station user and it determines which route list the call is to be routed over. You defined NPA, NXX, SPN and HNPA Digit Translation separately, and identified the parameters, limitations and intercept treatment for each.

You can now provision Digit Translation for the Meridian 1 switch, and you learned that during Digit Translation, the CPU would perform the following tasks when following the process of Digit Translation:

- Examine the number the station user dialed.
- Locate the number dialed in Digit Translation table as an NPA, NXX, SPN or HNPA.
- Determine the route list over which the call is to be routed.
- If the CPU cannot locate the dialed NPA, NXX or SPN, the call will go to flexible intercept as an invalid BARS Translation (NITR).

MODULE 5

SUPPLEMENTAL DIGIT RESTRICTION

INTRODUCTION

This module describes how Supplemental Digit Restriction (SDRR) may be used to deny a specific number or range of numbers after an NPA, SPN or NXX is dialed. Figure 1 on the following page gives you an example of Supplemental Digit Restriction, and how the translation table is used in the BARS software to verify a call.

OBJECTIVES

Given the Student Guide and class notes, the student should be able to:

- Identify the purpose of Supplemental Digit Restriction.
- Identify the parameters and limitations of Supplemental Digit Restriction.
- List the three possible intercept treatments for calls blocked via Supplemental Digit Restriction.

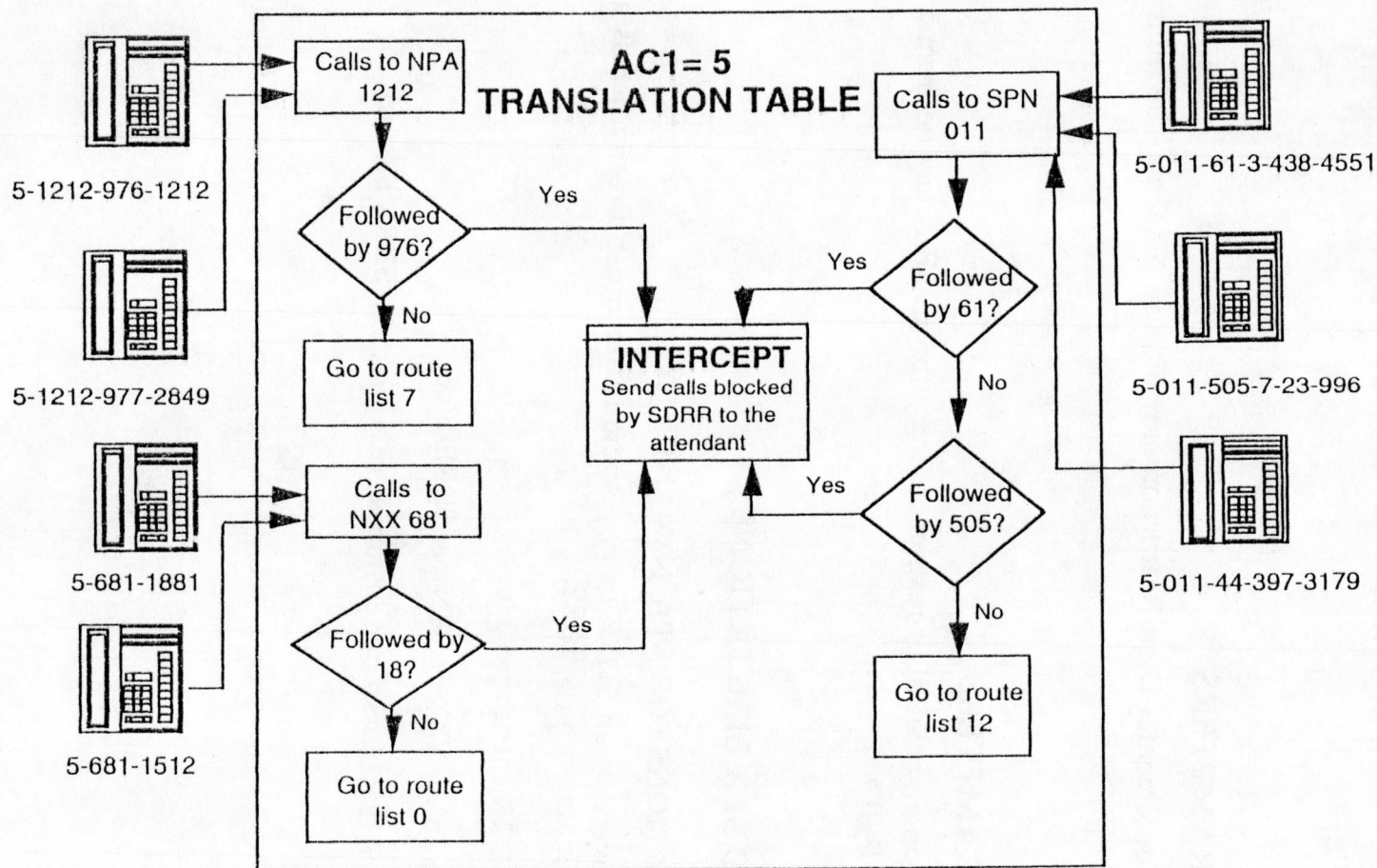
DEFINITION

The purpose of Supplemental Digit Restriction (SDRR) is to block access to a specific telephone number or a range of telephone numbers within an NPA, NXX or SPN. When Supplemental Digit Restriction is in effect for a specific telephone number or range of telephone numbers, access to those numbers will be denied to all station users.

PARAMETERS

- Supplemental Digit Restriction may be applied to an NPA, NXX or SPN.
- There may be no conflict between denied numbers for one NPA, one SPN or one NXX.
- To override an SDRR entry, a station user must directly access a trunk and bypass BARS. *→ T G A R Para Bloqueio neta
LD 16 y LD 10, 11*
- Calls blocked through SDRR are intercepted by network restriction (NRES). NRES must be provisioned in the Customer Data Block in LD 15.

SDRR



Translation Table
Figure 1

Bob Owen Hats, Inc. located in Dallas, Texas would like to deny all employees the capability of calling: dial-it numbers in New York City (1212-976-XXXX); KXIX Radio in Dallas (681-18XX); Australia (011-61-XX.....XX); and Nicaragua (011-505-XX.....XX).

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NPA SDRR PARAMETERS

- A Supplement Digit Restriction entry for an NPA may be from 1 to 7 digits.

NXX SDRR PARAMETERS

- A Supplemental Digit Restriction entry for an NXX may be from 1 to 4 digits.

SPN SDRR PARAMETERS

- A supplemental digit restriction entry for an SPN may be from 1 to 10 digits.

NPA, NXX AND SPN LIMITATIONS

SDRR LIMITATIONS FOR NPA, NXX AND SPN

- To override an SDRR entry a station user must directly access a trunk and bypass BARS.
- 64 SDRR entries per block.
- One NPA, NXX or SPN per SDRR block
- 256 SDRR blocks per customer. (Rls 19+, 512 SDRR blocks)

Provisioned Translation Table
Figure 2

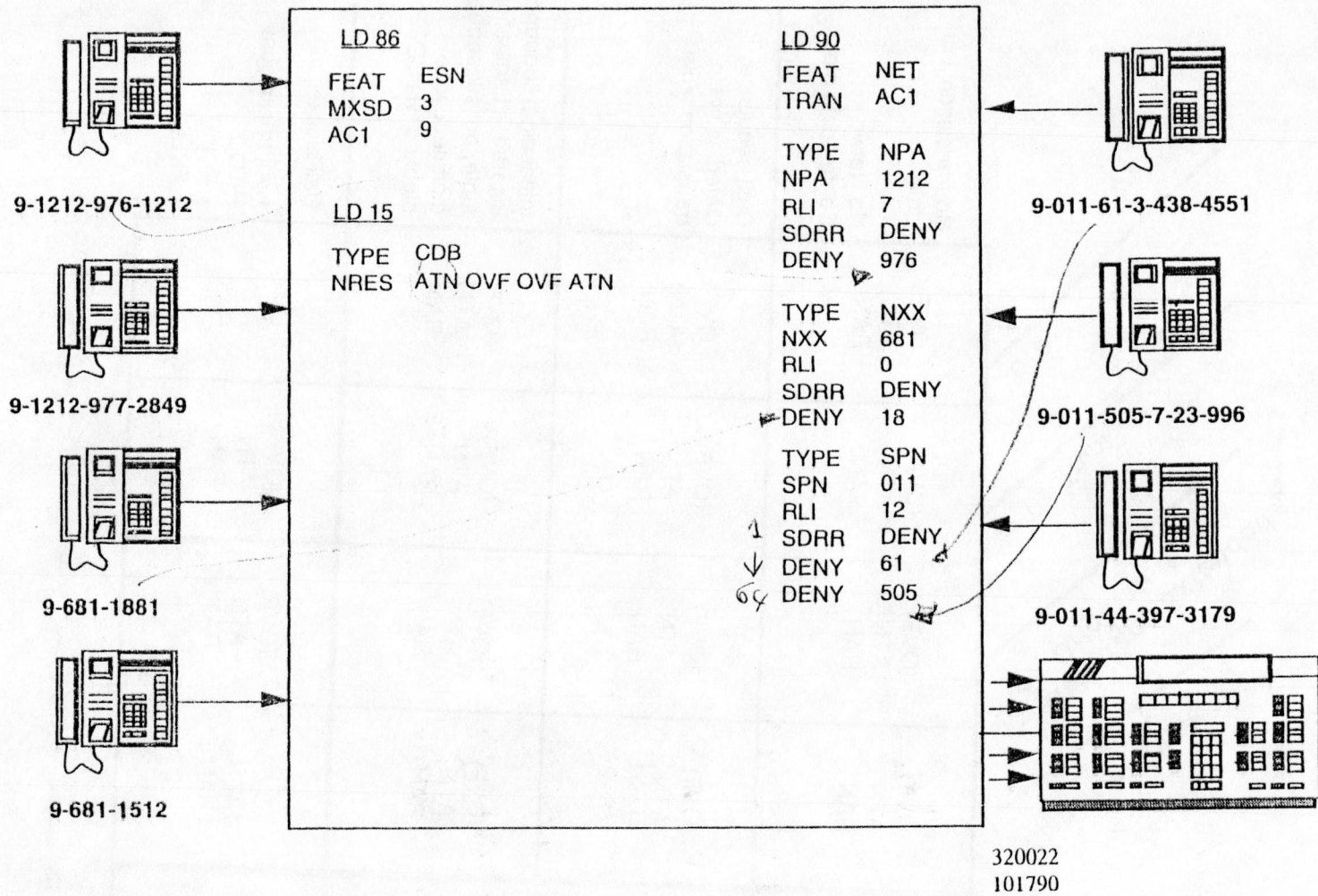


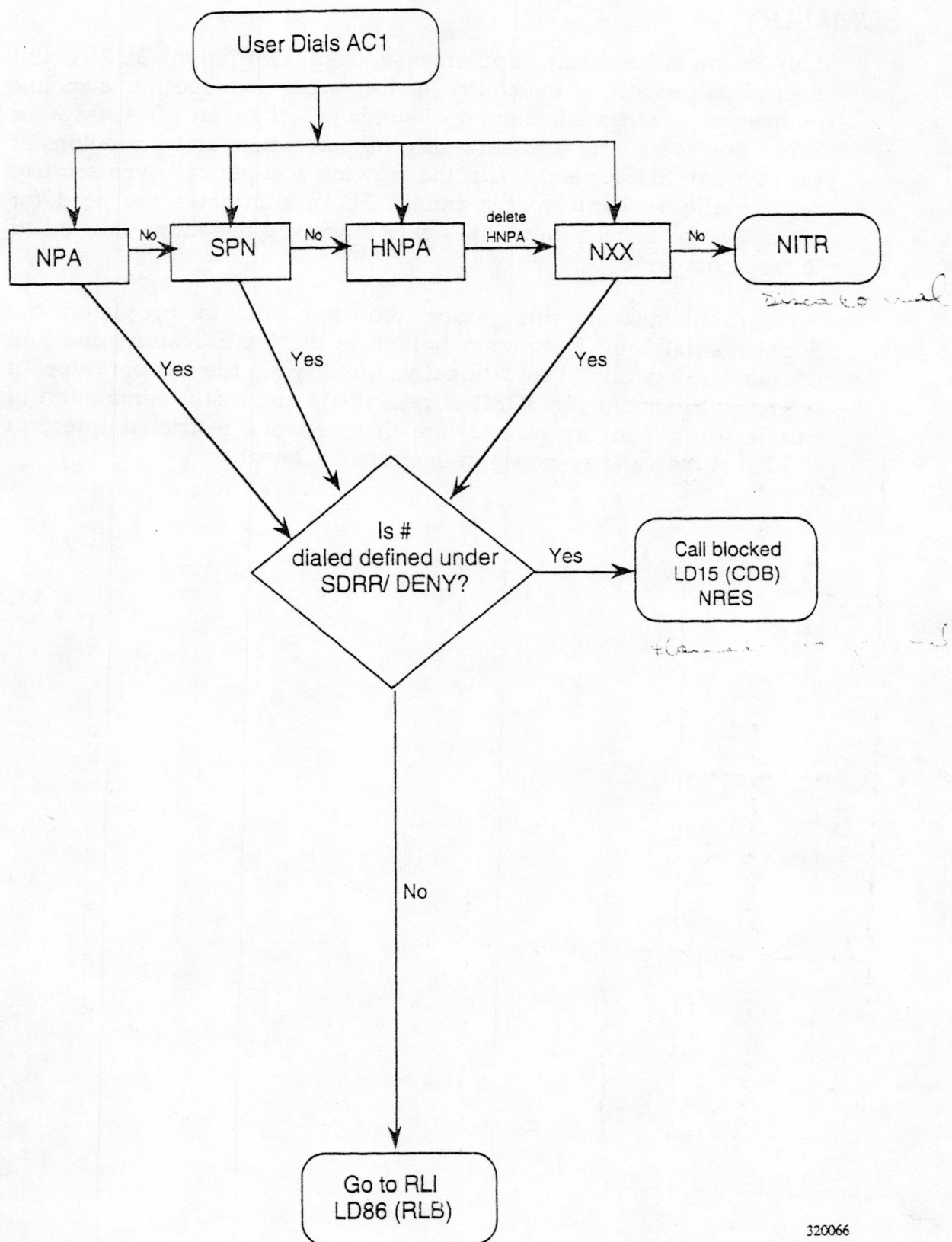
Figure 2

Network Intercept Treatment

	Station or DISA	Attendant-Extended or Originated	Tie Trunk	DID	
NINV	(OVF) ATN RAN	(OVF) ATN RAN	(OVF) ATN RAN	OVF (ATN) RAN	No translation table No Network Control data block
NITR	(OVF) ATN RAN	(OVF) ATN RAN	(OVF) ATN RAN	OVF (ATN) RAN	Digit sequence dialed is not in translation table
NRES	(OVF) ATN RAN	(OVF) ATN RAN	(OVF) ATN RAN	OVF (ATN) RAN	Initial digit sequence located in translation table, but subsequent digit sequence blocked via SDRR
NBLK	(OVF) ATN RAN	(OVF) ATN RAN	(OVF) ATN RAN	OVF (ATN) RAN	Call blocked via: • All trunks busy • TOD • FCI • FRL

Si se da una situación y los números con SDRR lo envía a la op.

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100590

SUMMARY

This lesson focused on Supplemental Digit Restriction (SDRR), and defined its purpose as the ability to block access to a specific telephone number or a range of telephone numbers within an NPA, NXX or SPN. You were able to distinguish the parameters and limitations of each type of SDRR also. With the growing cost-per-call type services being made available to the public, SDRR eliminates the need for customers to concern themselves over unwanted telephone calls billed to their company.

Your final task in this lesson required you to provision the Supplemental Digit Restriction portion of the BARS feature, and you did so successfully. Additionally, identifying the proper type of intercept treatment for SDRR is relevant to successful completion of this lesson. You are now aware that network restricted intercept (NRES) is the valid response to intercept treatment.

MODULE 6

SUPPLEMENTAL DIGIT RECOGNITION

INTRODUCTION

This module describes how the Meridian 1 can recognize a customer's Local telephone numbers and route these calls internally. This will prevent the use of two COTs or one COT and one DID for an internal call.

OBJECTIVE

Given the Student Guide and class notes, the student will be able to:

- Identify the purpose of Supplemental Digit Recognition for local listed directory numbers, (LDDD) and for local DID numbers (LDID).
- Identify the parameters and limitations of SDRR LDDD and LDID.

DEFINITION

The purpose of Supplemental Digit Recognition (SDRR) is to recognize Local DDD numbers or DID numbers that terminate at the local switch (switch performing call routing). Once these numbers are recognized, the system will terminate the call at a station if a DID number was dialed or at the attendant if a DDD number was dialed. This feature will eliminate the use of two CO trunks or a DID and a CO trunk for an internal call.

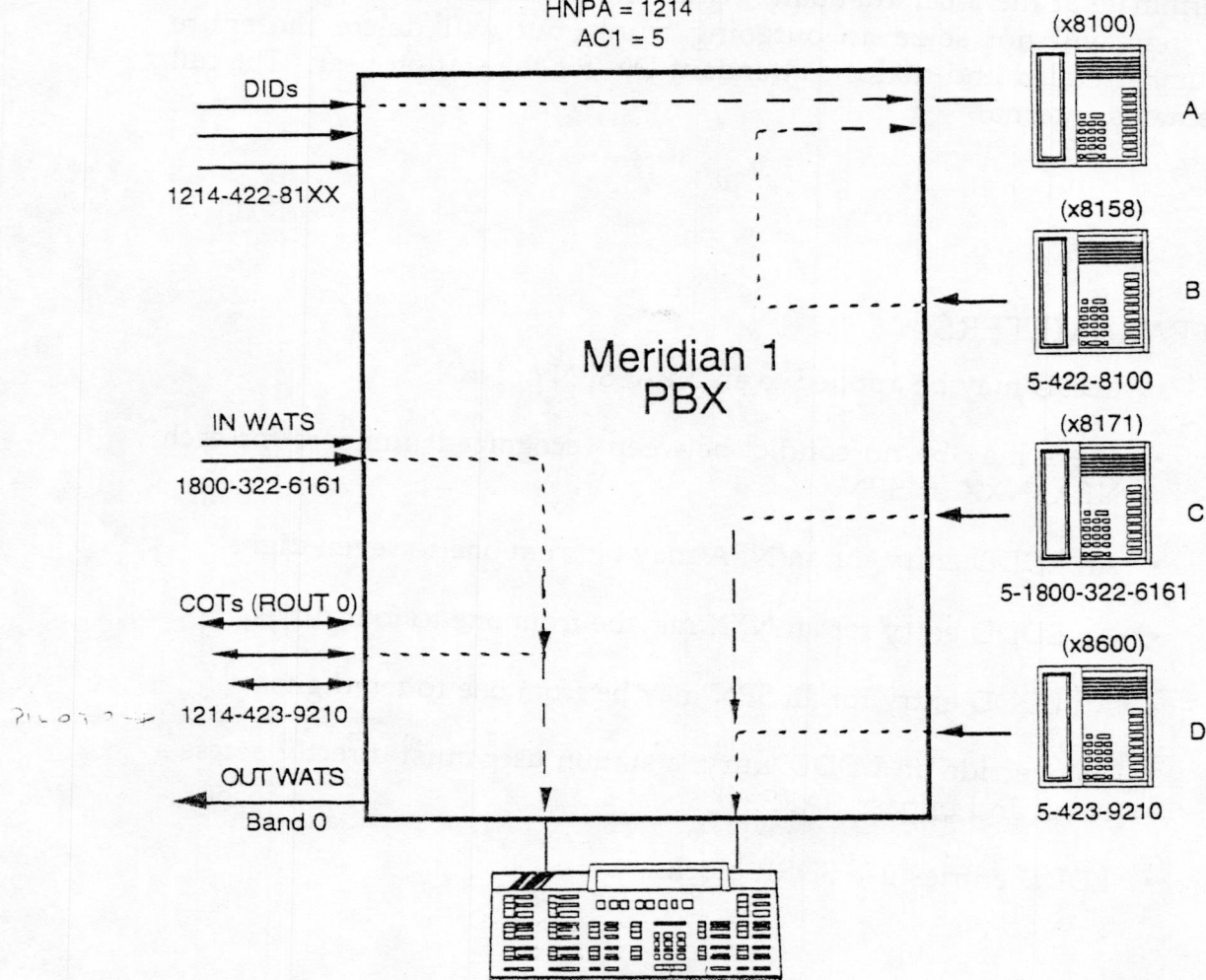
PARAMETERS

- There are two types of Supplemental Digit Recognition:
 1. Local DDD numbers (LDDD)
 2. Local DID numbers (LDID)
- LDDD is used to recognize a customer's local DDD numbers. (Public telephone numbers that terminate at an attendant console)
- LDID is used to recognize a customer's local DID numbers (Public telephone numbers that terminate at a station)
- LDDD may be applied to an NPA, NXX or SPN.
- LDID may be applied to an NPA, NXX or SPN.
- LDDD and LDID use SDRR blocks.
- Switch must be equipped with X11 software, Release 5 or greater.

Supplemental Digit Recognition Example 1

Figure 1

BOB OWEN HATS, INC. (DALLAS)
HNPA = 1214
AC1 = 5



Some employees at Bob Owen Hats, Inc. believe their internal calls will receive a prompter response if they appear to be incoming calls from the exchange network. Mr. Owen wishes to avoid this unnecessary use of trunk facilities.

Network Translation

- NPA 1214 to Route List Index 1
 - Recognize (LDID) 42281
 - Recognize (LDDD) 4239210
- NXX 422 to Route List Index 2
 - Recognize (LDID) 81
- NXX 423 to Route List Index 2
 - Recognize (LDDD) 9210
- SPN 1800 to Route List Index 2
 - Recognize (LDDD) 3226161

Route list index 1

entry 0 Band 0 WATS
entry 1 COT

Route list index 2

entry 0 COT

320084
110292

LDDD DEFINITION

The purpose of LDDD is to recognize numbers dialed that normally terminate at the local attendant. Once the numbers are recognized, the system will not seize an outgoing trunk, but will delete the entire number dialed and dial the attendant DN for the station user. The call remains internal.

LDDD PARAMETERS

- LDDD may be applied to an NPA, SPN or NXX.
- There may be no conflict between recognized numbers for each NPA, NXX or SPN.
- An LDDD entry for an NPA may be from one to seven digits.
- An LDDD entry for an NXX may be from one to four digits.
- An LDDD entry for an SPN may be from one to ten digits.
- To override an LDDD entry, a station user must directly access a trunk and bypass BARS.
- LDDD entries use SDRR blocks.

LDID DEFINITION

The purpose of LDID is to recognize numbers dialed that normally terminate at a local station. Once these numbers are recognized, the system will not seize an outgoing trunk, but will delete all but the station DN dialed and ring the internal station user. The call remains internal.

LDID PARAMETERS

- LDID may be applied to an NPA, SPN or NXX.
- There may be no conflict between recognized numbers for one NPA, one NXX or one SPN.
- An LDID entry for an NPA may be from one to seven digits.
- An LDID entry for an NXX may be from one to four digits.
- An LDID entry for an SPN may be from one to ten digits.
- To override an LDID entry, a station user must directly access a trunk and bypass BARS.
- LDID entries use SDRR blocks.

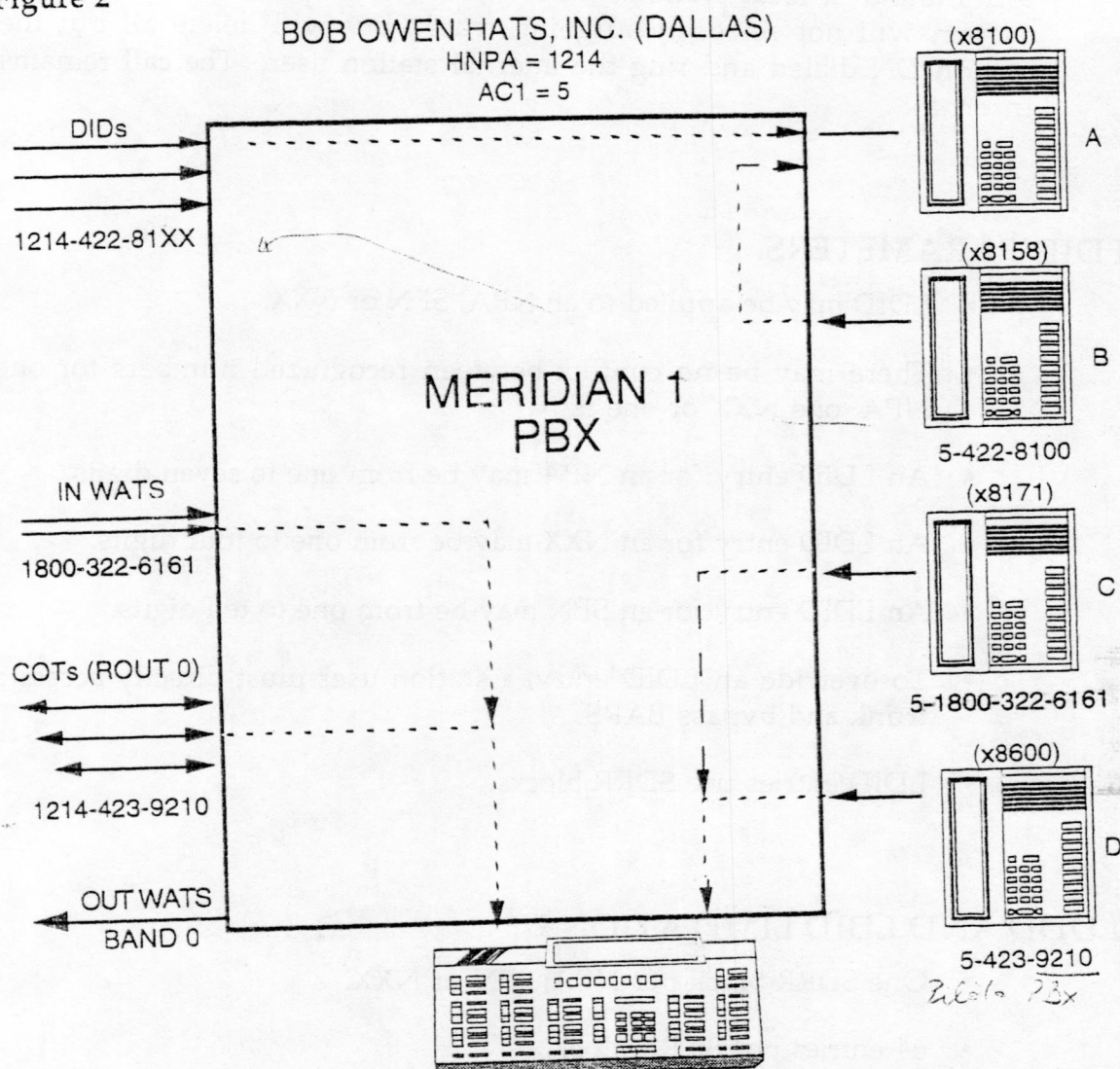
LDDD AND LDID LIMITATIONS

- One SDRR block per NPA, SPN or NXX.
- 64 entries per SDRR block.
- 256 SDRR blocks for a customer equipped with BARS software. (512 blocks with Rls. 19+)

PROVISIONING SUPPLEMENTAL DIGIT RECOGNITION

Supplemental Digit Recognition Example 2

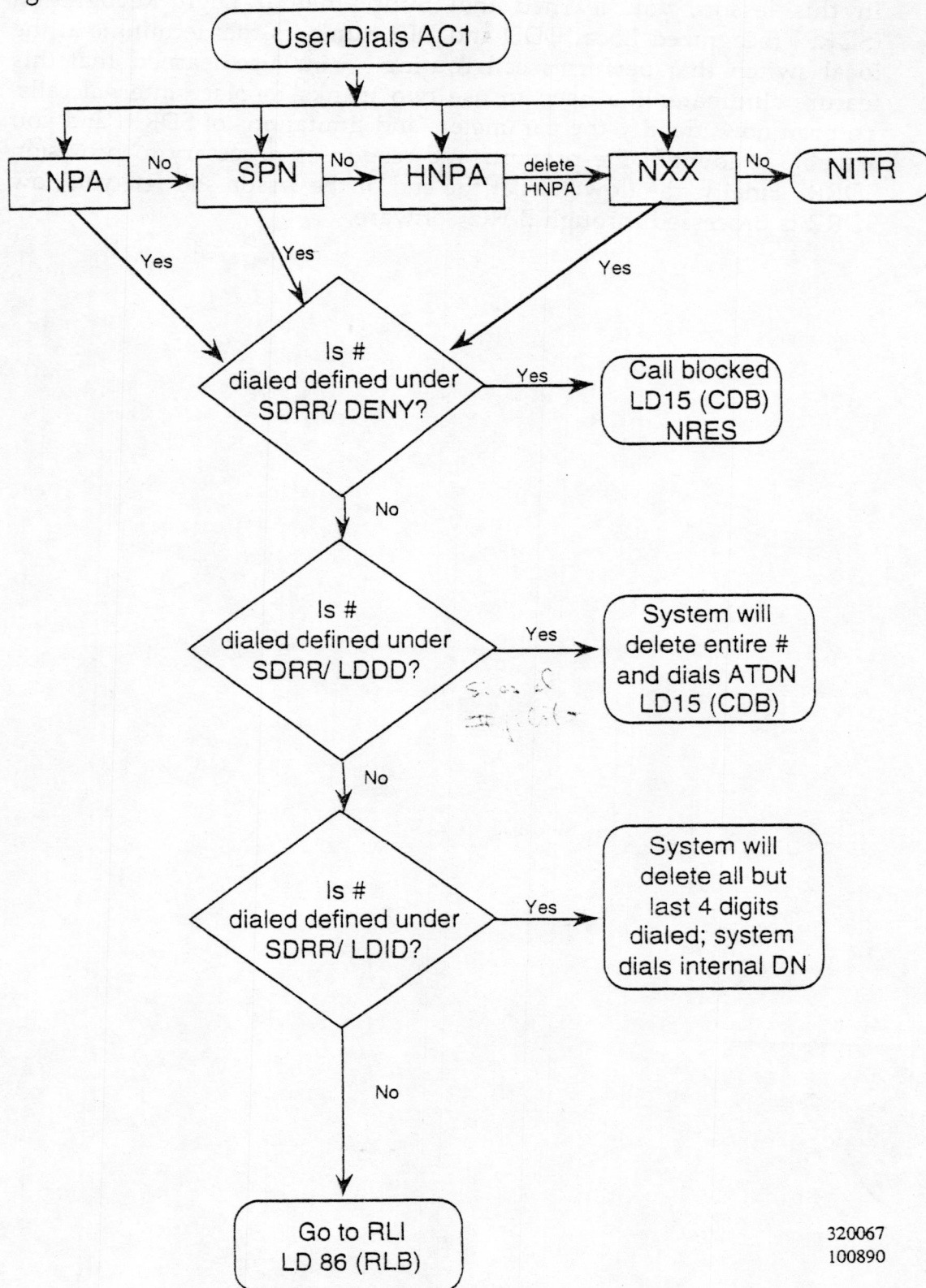
Figure 2



Some employees at Bob Owen Hats, Inc. believe their internal calls will receive a prompter response if they appear to be incoming calls from the exchange network. Mr. Owen wishes to avoid this unnecessary use of trunk facilities.

LD 86	LD 90	TYPE NXX	LD 86
FEAT ESN	FEAT NET	NXX 423	FEAT RLB
MXSD 7	TRAN AC1	RLI 2	RLI 1
AC1 5		SDRR LDDO	
		LDDO 9210	
	TYPE NXX	TYPE HNPA	ENTR 0
	NXX 422	HNPA 1214	ROUT 1
	RLI 2	RLI 1	ENTR 1
	SDRR LDID	SDRR LDID	ROUT 0
	LDID 81	LDID 42281	RLI 2
		SDRR LDDO	ENTR 0
		LDDO 4239210	ROUT 0
		TYPE SPN	
		SPN 1800	
		RLI 2	
		SDRR LDDO	
		LDDO 3226161	

320017
101592

BARS Flowchart
Figure 3

SUMMARY

In this lesson, you learned that Supplemental Digit Recognition (SDRR) recognized Local DDD and DID numbers that terminate at the local switch that performs call routing. You also learned that this feature eliminates the need to use two trunks to place internal calls. You can now identify the parameters and limitations of SDRR, and you are able to identify the prompts and responses necessary to provision SDRR. Finally, the flowchart at the end of the lesson showed you how SDRR is processed through BARS software.

MODULE 7

INCOMING TRUNK GROUP EXCLUSION

INTRODUCTION

This module describes how the Meridian 1 can recognize or deny specific digits or a range of digits to incoming TIE callers only.

OBJECTIVE

Given the Student Guide and class notes, the student should be able to:

- Identify the purpose of Incoming Trunk Group Exclusion for NPA, NXX, and SPN codes.
- Identify the parameters and limitations of Incoming Trunk Group Exclusion for NPA, NXX, and SPN codes.
- Identify the three possible intercept treatments for calls blocked via Incoming Trunk Group Exclusion.

DEFINITION

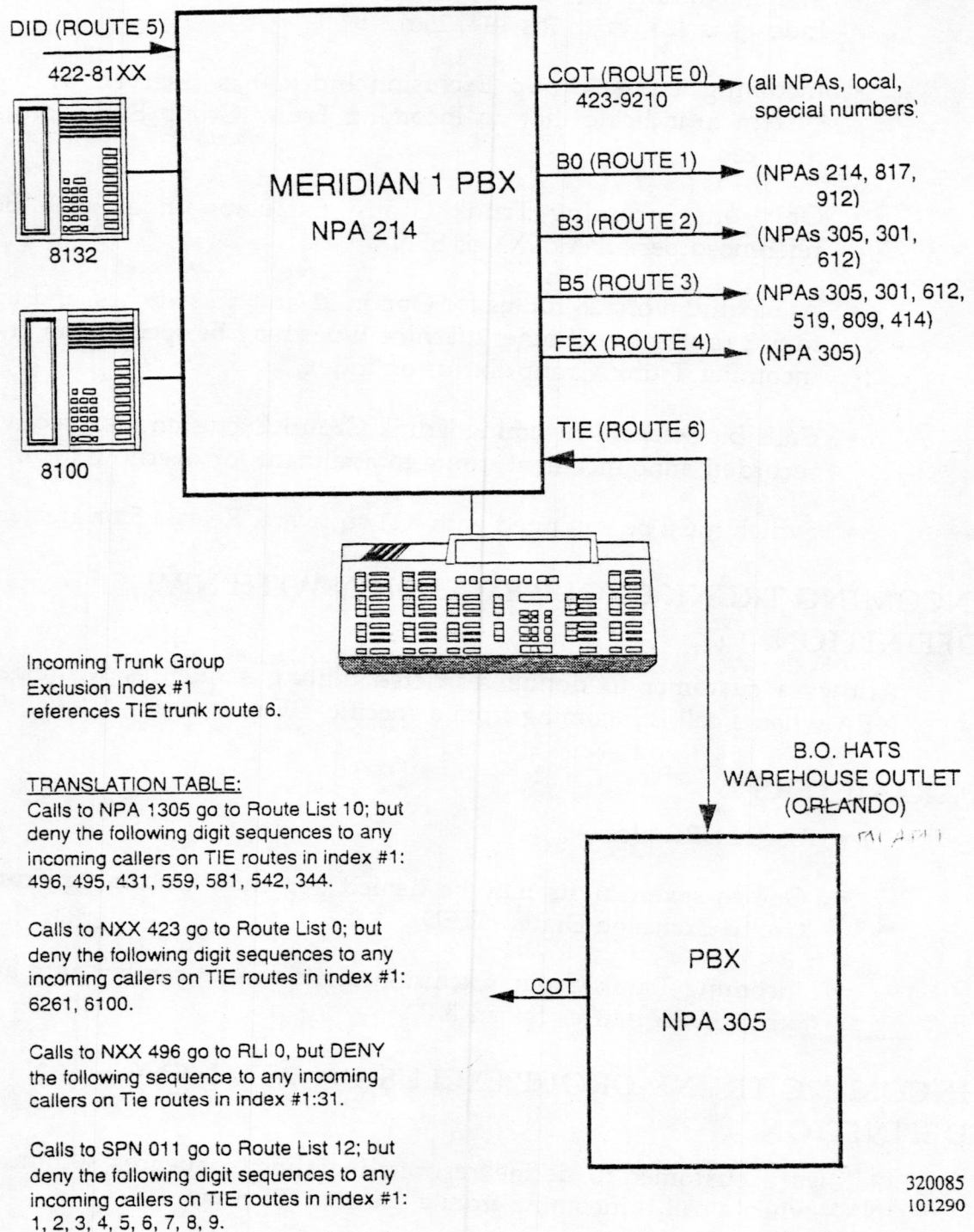
Incoming Trunk Group Exclusion allows a customer to define restricted dialing sequences within an NPA, NXX or SPN when the call is incoming from a specific TIE route. The restricted dialing sequences are listed in the Network Translation Table (SDRR) and the restricted TIE routes are listed in an Incoming Trunk Group Exclusion Index.

Use the Bob Owen Hats, Inc. graphic on the following page to address the following problem/scenario:

Mr. Owen wishes to deny incoming callers over the TIE route from the warehouse outlet in Orlando, FL the ability to call the following numbers through his BARS software: NXXs local to the PBX in Orlando (495, 496, 431, 559, 581, 542, 344); 423-6261, 423-6100 and 496-3100 through 496-3199 in Dallas; and any international calls (011).

ITGE Problem/Scenario

Figure 1

BOB OWEN HATS, INC. (DALLAS)

PARAMETERS

- May be applied to an NPA, NXX or SPN.
- The maximum number of Incoming Trunk Group Exclusion Indexes is 128 (With Rls 19+, 256).
- Incoming Trunk Group Exclusion Index 0 is reserved by the system to indicate that no Incoming Trunk Group Exclusion is required.
- Only one Incoming Trunk Group Exclusion Index may be referenced per NPA, NXX or SPN.
- A maximum of 128 routes for Option 21 and ST switches, and up to 512 routes for all other machine types may be specified in one Incoming Trunk Group Exclusion index.
- Calls blocked via Incoming Trunk Group Exclusion may receive recorded announcement, route to attendant, or overflow tone.
- Switch must be equipped with X11 software, Release 5 or greater.

INCOMING TRUNK GROUP EXCLUSION WITH NPA DEFINITION

Allows a customer to define restricted dialing sequences within an NPA when a call is incoming from a specific TIE route.

PARAMETERS

- Uses SDRR blocks
- One to seven digits may be denied per entry (Incoming Trunk Group Exclusion Digits - ITED).
- Incoming Trunk Group Exclusion digits cannot conflict with any other SDRR entries for an NPA.

INCOMING TRUNK GROUP EXCLUSION WITH NXX DEFINITION

Allows a customer to define restricted dialing sequences within an NXX when a call is incoming from a specific TIE route.

PARAMETERS

- Uses SDRR blocks.

- One to four digits may be denied per entry (Incoming Trunk Group Exclusion Digits - ITED).
- Incoming Trunk Group Exclusion digits cannot conflict with any other SDRR entries for an NXX.

INCOMING TRUNK GROUP EXCLUSION WITH SPN DEFINITION

Allows a customer to define restricted dialing sequences within an SPN when a call is incoming from a specific TIE route.

PARAMETERS

- Uses SDRR blocks.
- One to ten digits may be denied per entry (Incoming Trunk Group Digits).
- Incoming Trunk Group Exclusion digits cannot conflict with any other SDRR entries for an SPN.

LIMITATIONS OF NPA, NXX AND SPN ITED

- 64 entries per NPA, NXX or SPN
- One SDRR block per NPA, NXX or SPN.
- 256 SDRR blocks per customer.(512 blocks with Rls 19+)

FEATURE INTERACTIONS

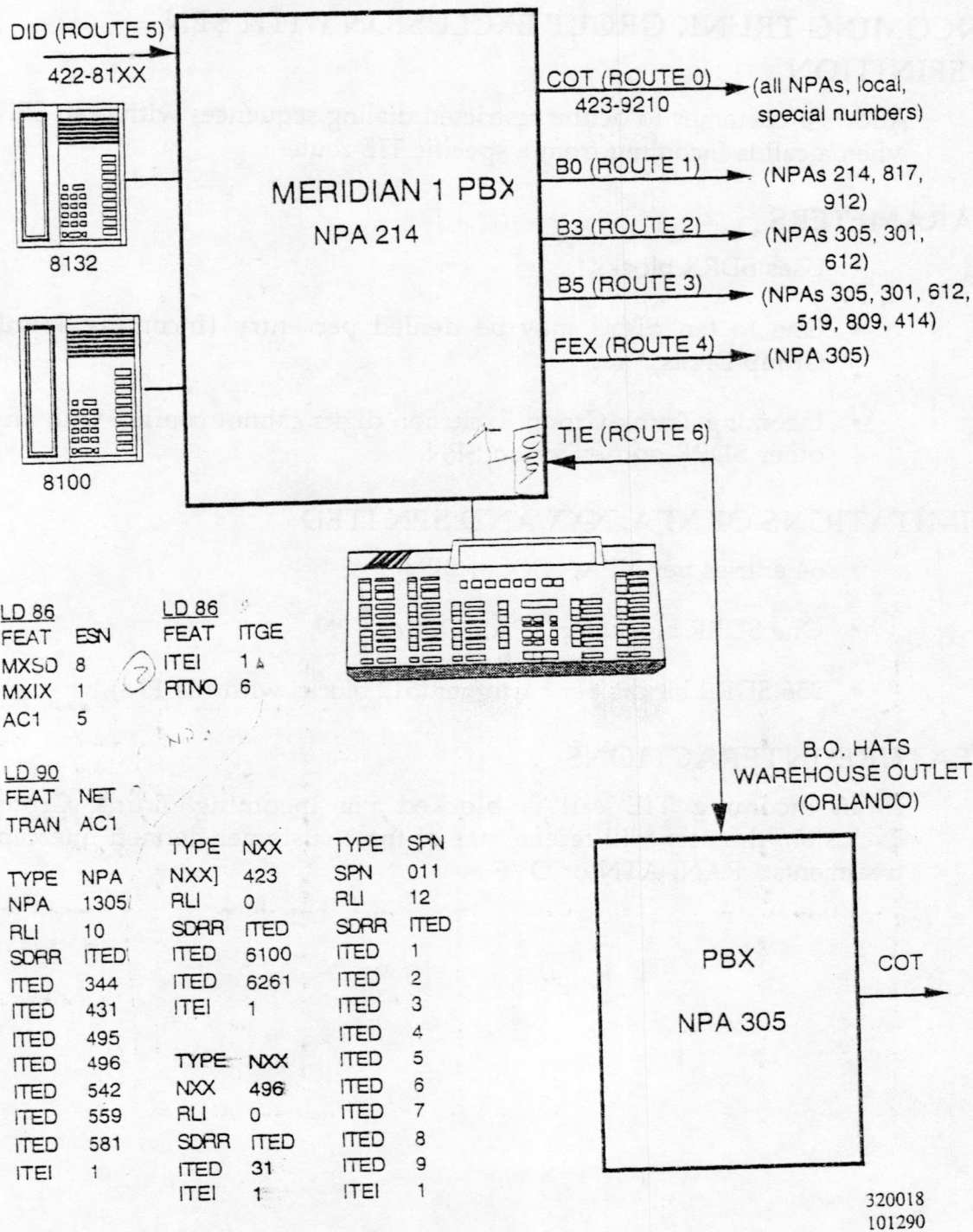
If an incoming TIE call is blocked via Incoming Trunk Group Exclusion, the user will receive one of three customer-defined intercept treatments: RAN, ATN or OVF.

PROVISIONING INCOMING TRUNK GROUP EXCLUSION

ITGE Provisioned Problem/Scenario

Figure 2

BOB OWEN HATS, INC. (DALLAS)



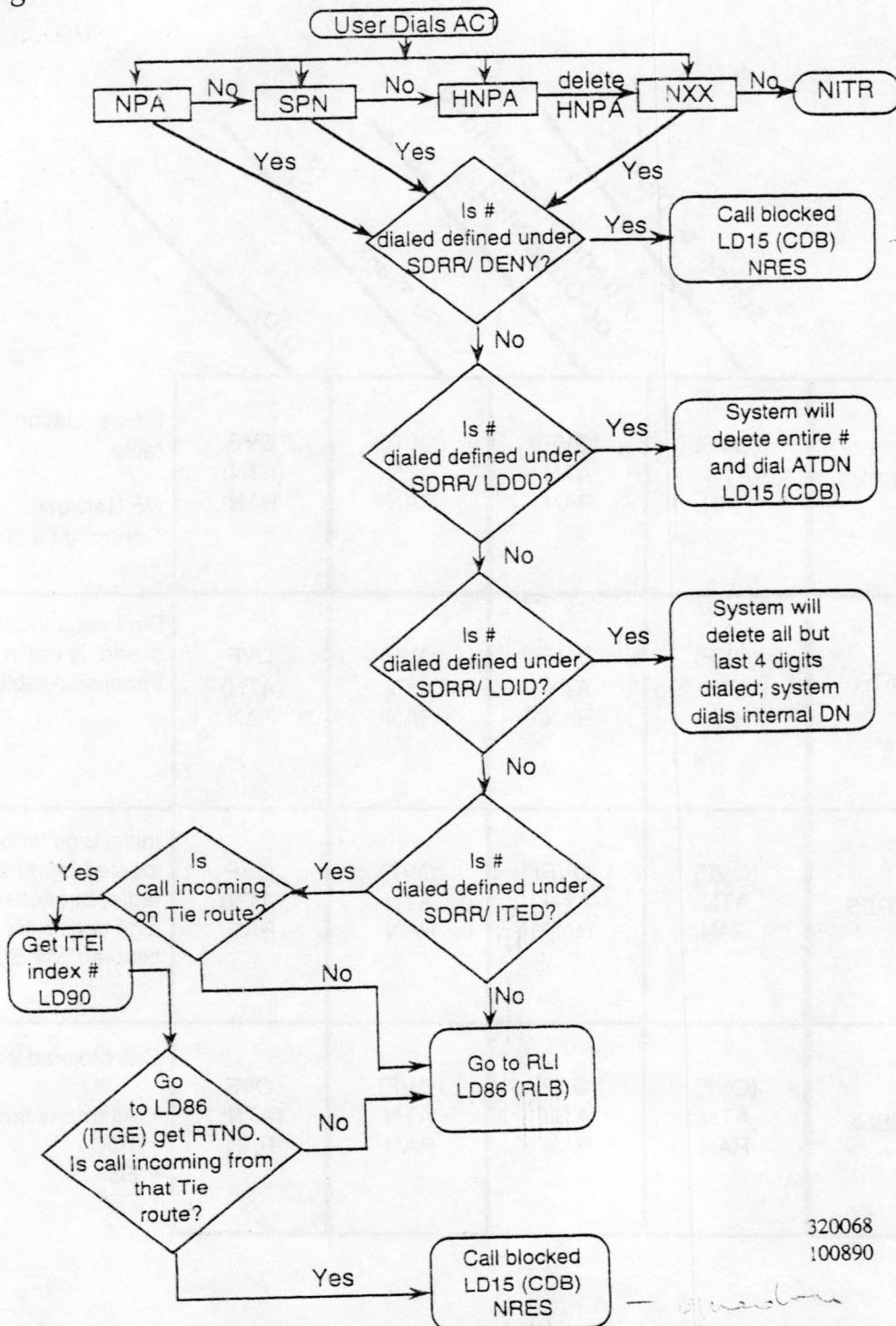
Network Intercept Treatment Chart
Figure 3

Network Intercept Treatment

	Station or DISA	Attendant-Extended or Originated	Tie Trunk	DID	
NINV	(OVF) ATN RAN	(OVF) ATN RAN	(OVF) ATN RAN	OVF (ATN) RAN	No translation table No Network Control data block
NITR	(OVF) ATN RAN	(OVF) ATN RAN	(OVF) ATN RAN	OVF (ATN) RAN	Digit sequence dialed is not in translation table
NRES	(OVF) ATN RAN	(OVF) ATN RAN	(OVF) ATN RAN	OVF (ATN) RAN	Initial digit sequence located in translation table, but subsequent digit sequence blocked via SDRR
NBLK	(OVF) ATN RAN	(OVF) ATN RAN	(OVF) ATN RAN	OVF (ATN) RAN	Call blocked via: • All trunks busy • TOD • FCI • FRL

320058
100290

ITGE Flowchart
Figure 4



SUMMARY

Incoming Trunk Group Exclusion allows the Meridian 1 customer to perform Supplemental Digit Restriction/Recognition on TIE facilities. ITGE is defined as allowing a customer to define restricted dialing sequences within an NPA, NXX or SPN when the call is incoming from a specific TIE route. In this lesson, you learned to define the different types of ITGE, their parameters and limitations.

Additionally, you learned the correct prompts and responses to provision ITGE, and how to apply the correct type of intercept treatment when provisioning ITGE.

MODULE 8

AUTOMATIC LEAST COST ROUTING

INTRODUCTION

This module describes Automatic Least Cost Routing. For each call that passes network translation in the Meridian 1, the BARS software will select a route from a list of up to 64¹⁵⁺, 32¹³⁺ or 8 (prior to Release 13) outgoing alternate routes to complete a call.

OBJECTIVE

Given the Student Guide and class notes, the student should be able to:

- Identify the purpose of Route Lists.
- Identify the parameters and limitations of Route Lists.
- Identify how the system searches a Route List for an idle trunk.
- State the function of the Initial Set.
- Identify the definition and parameters of Expensive Route Warning Tone.
- Identify the three types of intercept treatments that the user may receive if unable to complete a call over a Route List.

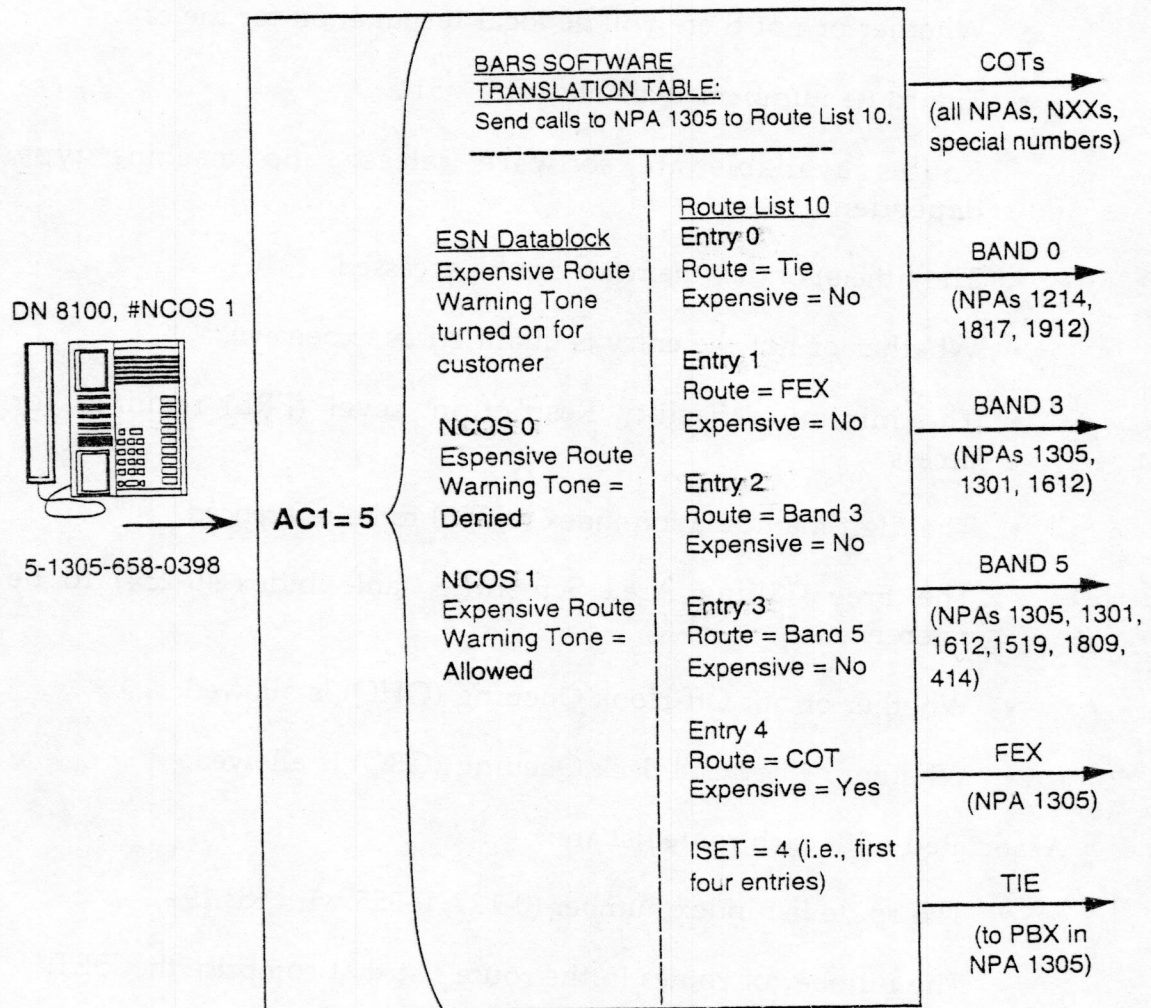
DEFINITION

Automatic least cost routing is the method by which BARS automatically routes a call over the most cost-effective route available.

For each call that passes network translation, BARS selects a route from a list of up to 64¹⁵⁺, 32¹³⁺ or 8 (prior to Release 13) outgoing alternate routes to complete a call. A list of routes over which calls to a particular destination may be completed is called a Route List and each route specified in a list is called an Entry. BARS always searches a route list beginning at entry 0 and ending at the last entry in the route list.

Any combination of outgoing trunks (e.g., COT, FEX or TIE) can be specified in a Route List. The first entries in a Route List are the "least-cost" routes to a destination and comprise the "initial set" (ISET) of routes in the list. The last entries in the list are less cost-effective and comprise the "extended set" (ESET) of routes in the list.

ALCR Translation Table
Figure 1



320086
101290

PARAMETERS

Associated with each entry in a Route List are:

- The entry number (0-63¹⁵⁺), (0-31¹³⁺) or (0-7 prior to Release 13).
- Whether or not there will be local termination for the call.
- The route numbers available are 0 - 511.

Routes available are software release and machine type dependent.

- The time(s) of day the route can be accessed.
- Whether or not the entry is qualified as expensive.
- The minimum Facility Restriction Level (FRL) required for access.
- The digit manipulation index (0-255) to be referenced.

The Free Calling Area Screening table index (0-254) to be referenced.

- Whether or not Off-Hook Queuing (OHQ) is allowed.
- Whether or not Call Back Queuing (CBQ) is allowed.

Associated with each route list are:

- The route list index number (0-127, 0-255 with Rls.19+).
- The number of routes in the route list that comprise the ISET.

LIMITATIONS

- There may be a maximum of 64¹⁵⁺ (0-63), 32¹³⁺ (0-31) or 8 (0-7 prior to Release 13) entries per route list.
- There may be a maximum of 128 route lists or 256 (with Rls.19+) per customer (0-127 or 0-255).

ISSET DEFINITION

- The routes in a route list that are considered inexpensive.
- The routes in a route list over which the system will attempt to complete a call before checking for OHQ or CBQ eligibility.

ISSET PARAMETERS

- Entries in a route list should be listed in order of search from least expensive to most expensive.
- All entries that are not part of the ISET are called the Extended Set (ESET).
- There is a procedure called declaring the ISET. After declaring the ISET, the remaining entries automatically become the ESET.

The ISET must be defined in order to allow queuing capability.

EXPENSIVE ROUTE WARNING TONE DEFINITION

The Expensive Route Warning Tone alerts the caller an expensive route has been selected to complete the call, and provides the caller with the option of either accepting, aborting, or pressing the Ring Again Key and entering the Call Back Queue for inexpensive entries. Expensive Route Warning Tone is three bursts of tone.

EXPENSIVE ROUTE WARNING TONE PARAMETERS.

For a user to hear Expensive Route Warning Tone, all four of the following criteria must be met for the call:

- Expensive Route Warning Tone must be turned on for the customer.
- Expensive Route Warning Tone must be turned on for the station's NCOS.
- The entry the system has chosen for this call must be in the ESET.
- The entry the system has chosen for this call must be classified as expensive.

AUTOMATIC LEAST COST ROUTING AND DIGIT TRANSLATION

- A station user dials the BARS access code plus the desired number. AC+(1)+NPA+NXX+XXXX
- The access code tells the system to process this call through BARS and send the call to Network Translation.
- BARS locates the first 1-4 digits dialed (Release 4-7) or 1-11 digits dialed (Release 8) and identifies the associated route list index number.
- If no Supplemental Digit Restriction or Recognition is in effect, BARS proceeds to the specified route list.
- BARS then searches the route list starting with entry 0 and ending at the last entry in the route list until an idle, eligible trunk is found.
- When an idle, eligible trunk is found, BARS checks the Expensive Route Warning Tone Parameters:
 - Expensive Route Warning Tone turned on for customer. LD 86 ERWT
 - Expensive Route Warning Tone turned on for user's NCOS. LD 87 LD 10 LD 11 CLS WTA NETL
 - Entry is in ESET.
 - Entry is classified as expensive.

If all four of the above parameters are met, the user hears expensive route warning tone. The user will have from two to ten seconds (customer-defined) to either:

- Hang up and try again later;
- Remain off-hook, allowing the call to complete on the expensive entry; or
- Depress Ring Again and queue for the inexpensive entries in the route list

If any one of the four parameters is not met, the call completes over the expensive entry. The user will not hear Expensive Route Warning Tone.

BUILDING ROUTE LISTS

For a switch to be most cost-effective, one Route List must be created for each different type of call the customer makes.

A four-step process is used to determine the appropriate number of Route Lists required:

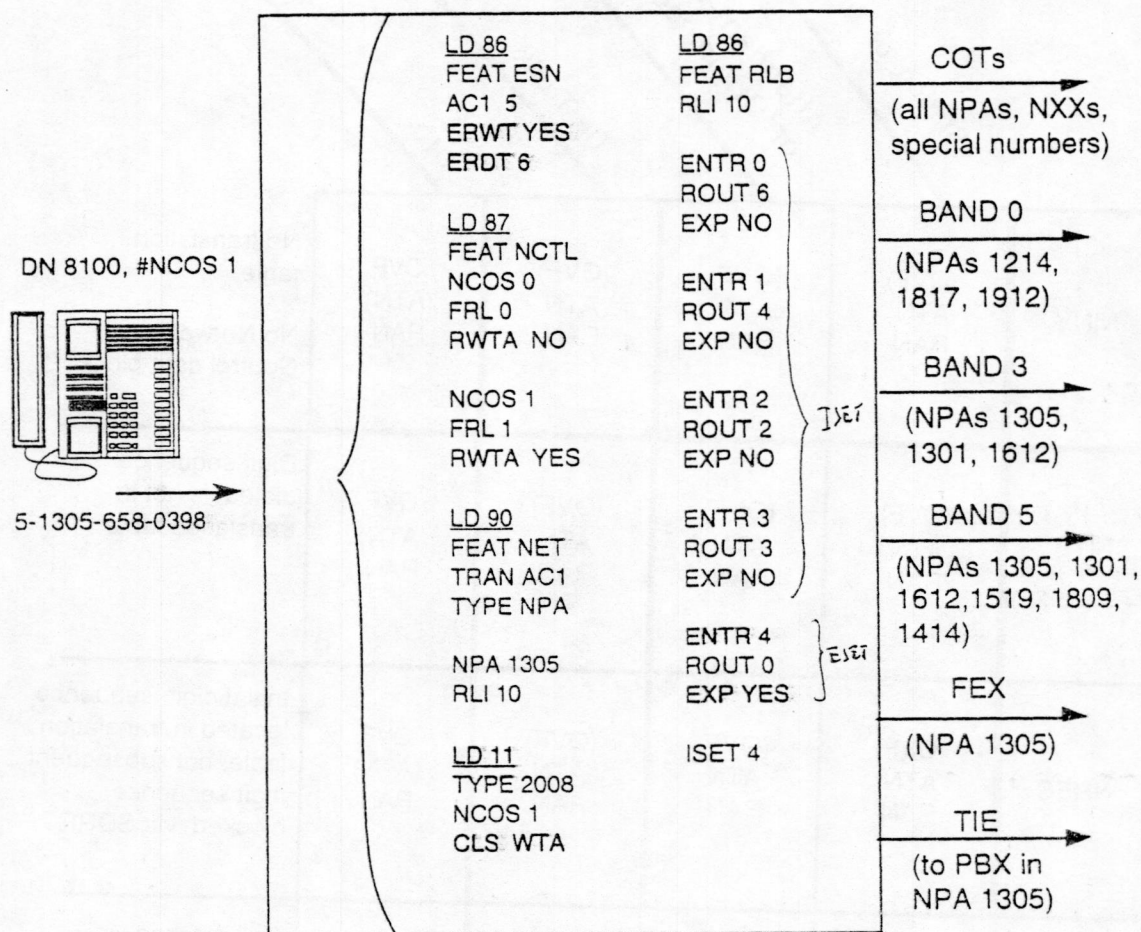
- List the trunk routes the customer has by route number, type of trunk route, and calling area served by that route.
- List the various types of calls the customer will make (e.g., local international, intrastate).
- For every Route list created, identify each trunk route that can process calls to the destination. In order of search, assign a Route List entry number to each trunk route.
- Assign a Route List number to each type of call.

Use the worksheet on the following page to build route lists.

320087
101590

[illegible]

ALCR Translation Table Provisioned
Figure 3



320088
101290

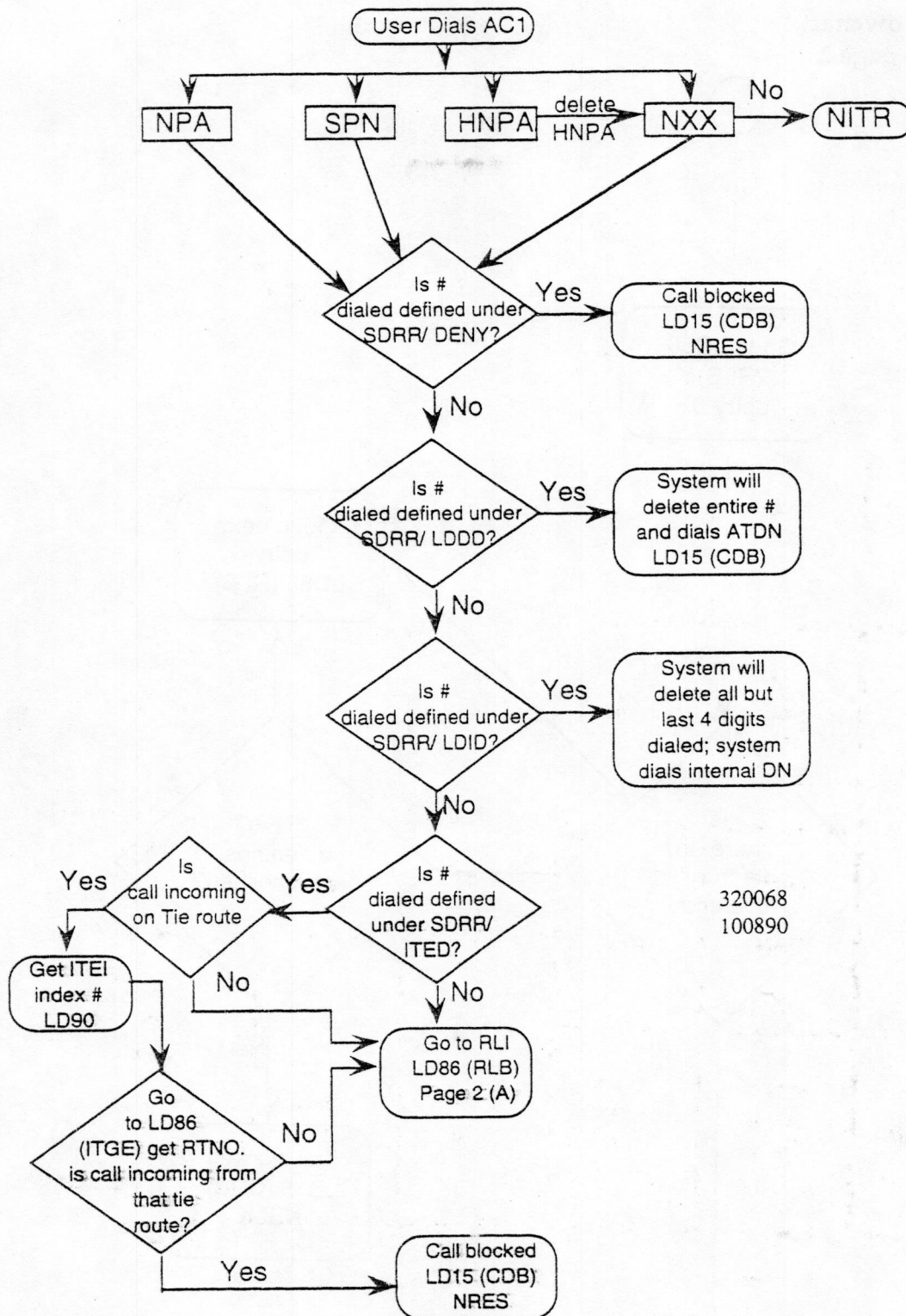
NCOS 0 FRL 0 → LOCALS / NPA guide table for bands.
 NCOS 1 FRL 1 → " LOCALS
 NCOS 2 FRL 2 → " "L, N
 NCOS 3 FRL 3 → " "L, N, X
 NCOS 4 FRL 4 → " "L, N, X, OP

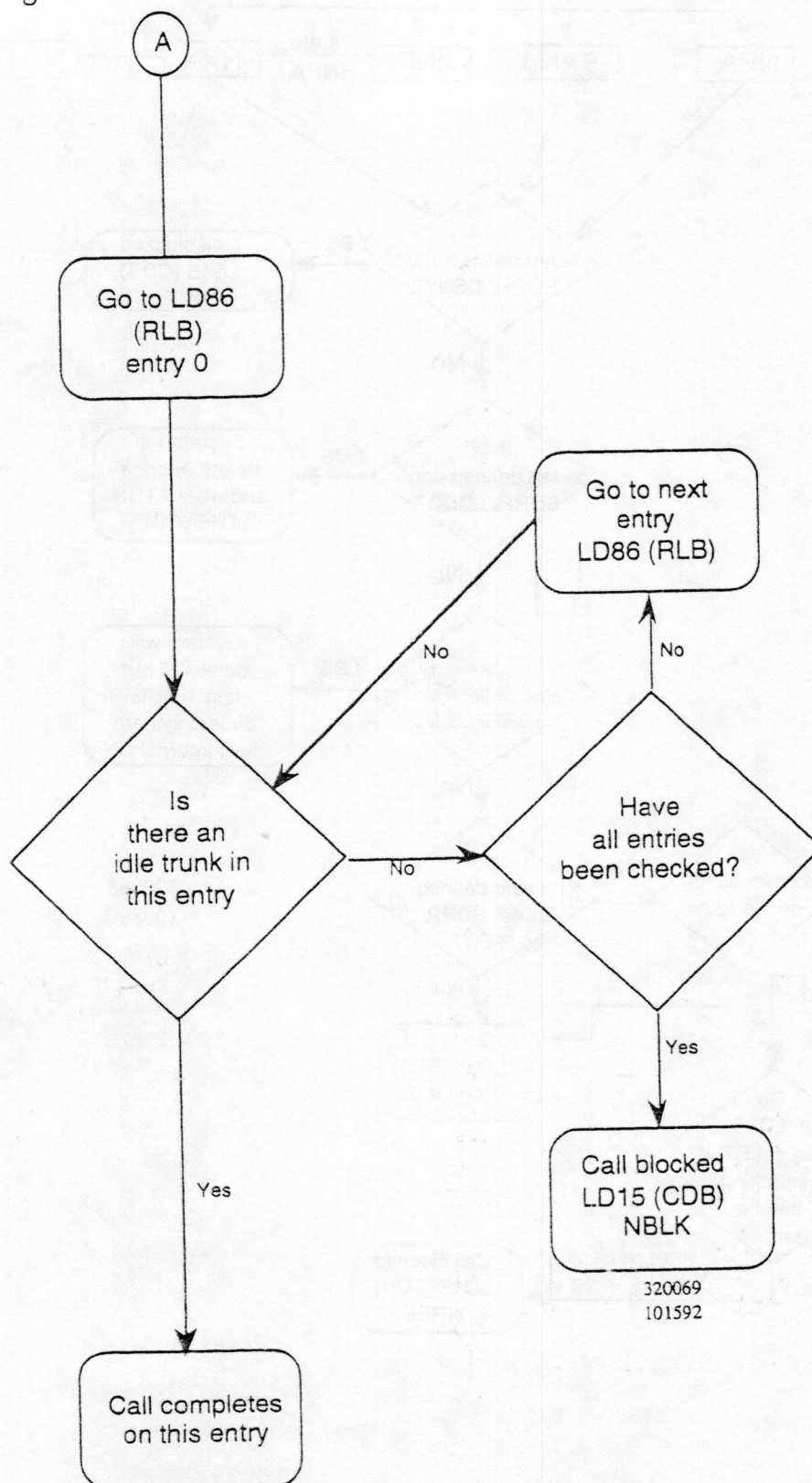
Network Intercept Treatment

	Station or DISA	Attendant-Extended or Originated	Tie Trunk	DID	
NINV	(OVF) ATN RAN	(OVF) ATN RAN	(OVF) ATN RAN	OVF (ATN) RAN	No translation table No Network Control data block
NITR	(OVF) ATN RAN	(OVF) ATN RAN	(OVF) ATN RAN	OVF (ATN) RAN	Digit sequence dialed is not in translation table
NRES	(OVF) ATN RAN	(OVF) ATN RAN	(OVF) ATN RAN	OVF (ATN) RAN	Initial digit sequence located in translation table, but subsequent digit sequence blocked via SDRR
NBLK	(OVF) ATN RAN	(OVF) ATN RAN	(OVF) ATN RAN	OVF (ATN) RAN	Call blocked via: • All trunks busy • TOD • FCI • FRL

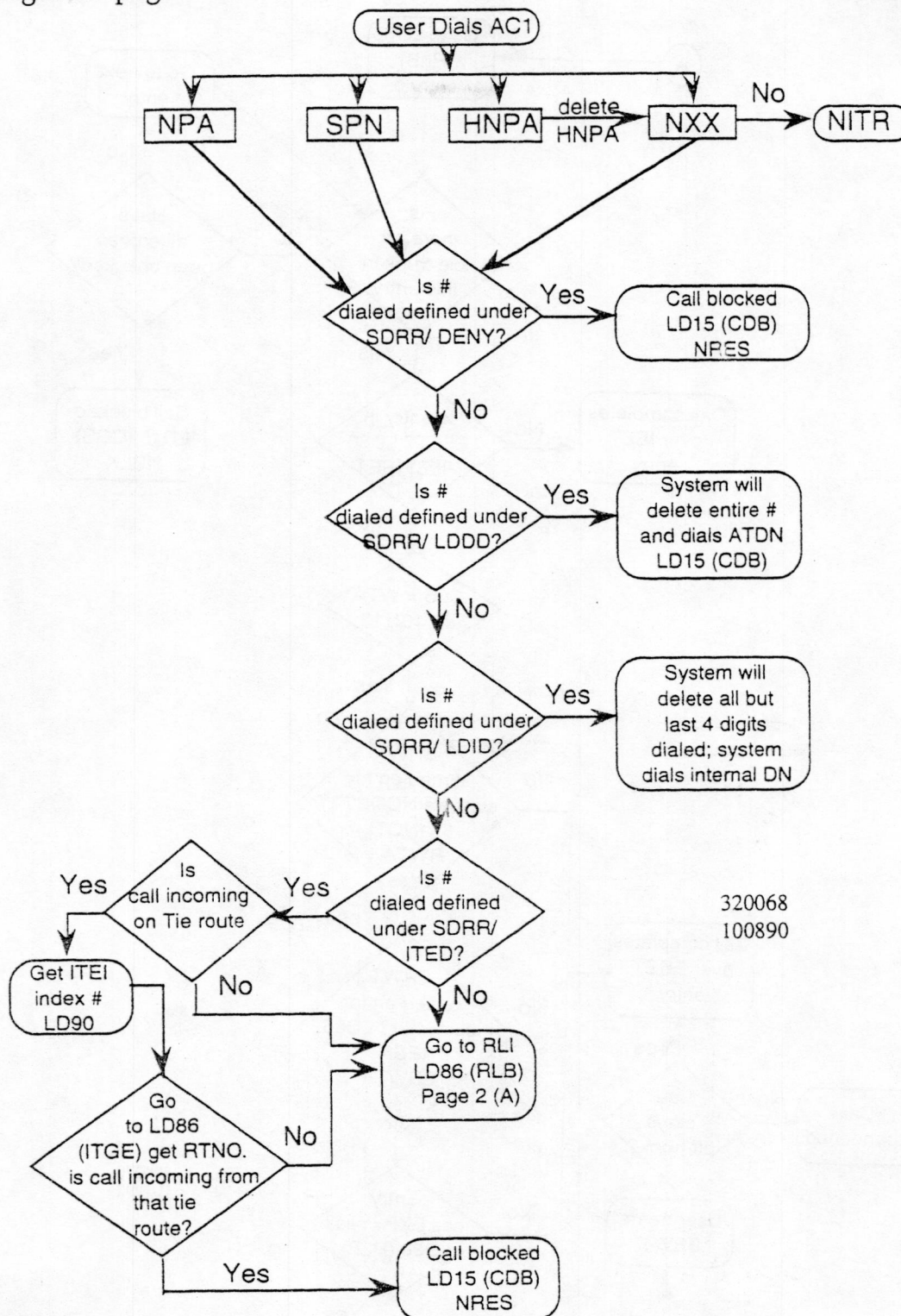
320058
100290

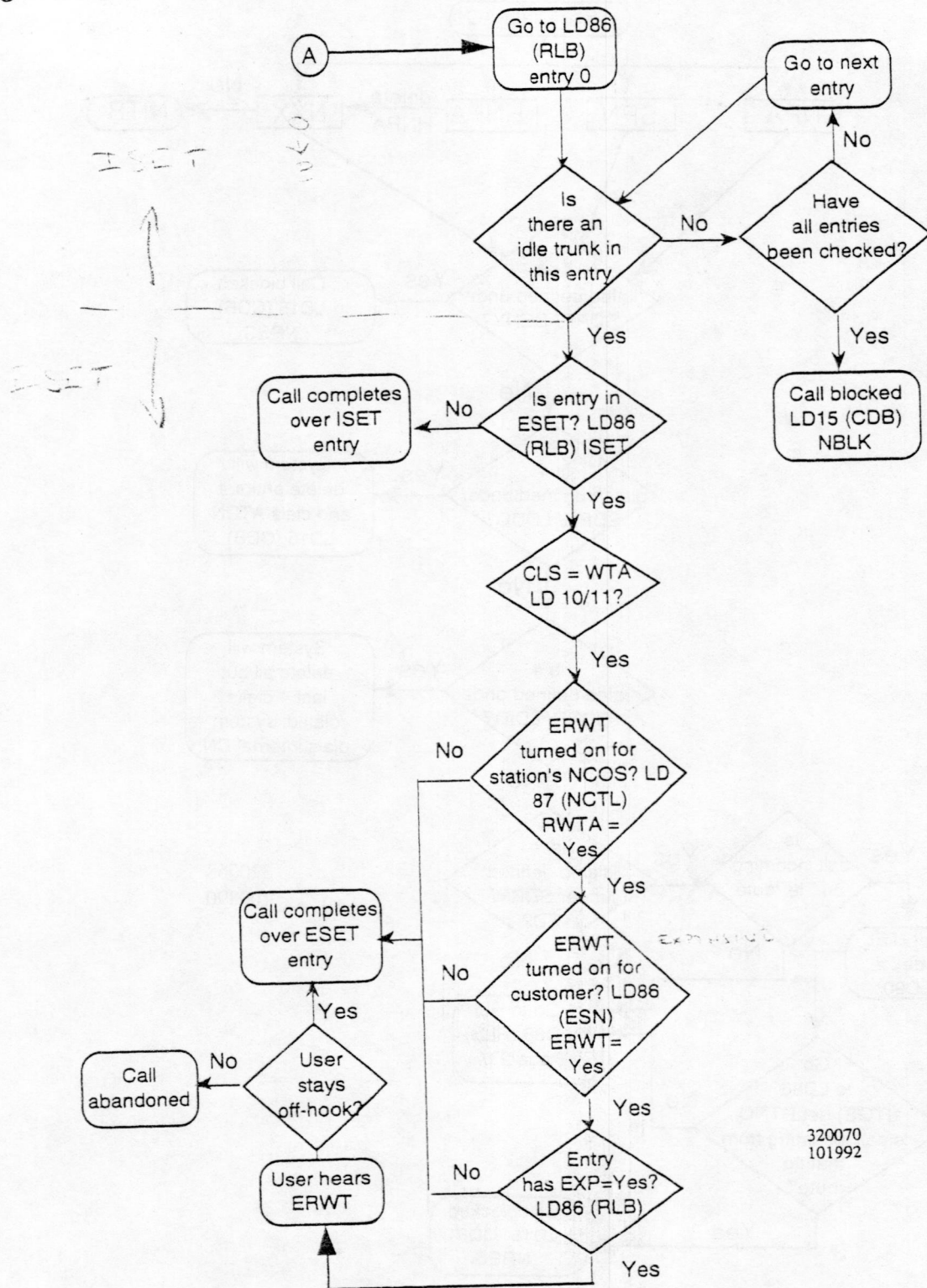
BARS Flowchart
Figure 5 page 1



BARS Flowchart
Figure 5 page 2

ERWT Flowchart
Figure 6 page 1



ERWT Flowchart
Figure 6 page 2

SUMMARY

In this lesson, you learned that Automatic Least Cost Routing is the method by which BARS automatically routes a call over the most cost-effective route available. You identified the parameters and limitations associated with ALCR, as well as ISET, ESET and ERWT. You also learned the steps necessary to build Route Lists. You identified how a call is processed through ALCR, and what treatment a call would receive if blocked.

You learned how to provision ALCR, and you also learned how to provision the ERWT for each route list. You identified the intercept treatment that can be applied to ALCR, and you provisioned that also.

MODULE 9

TIME OF DAY SCHEDULES

INTRODUCTION

This module describes the purpose and parameters of Time of Day Schedules. Time of Day Schedules are used in route lists to specify the times during a 24-hour day during which an entry cannot be accessed.

OBJECTIVE

Given the Student Guide and class notes, the student should be able to:

- Identify the purpose of Time of Day Schedules.
- Identify the parameters and limitations of Time of Day Schedules.
- Identify the three possible intercept treatments provided if a user is denied access to any Route List entries because of Time of Day schedules.

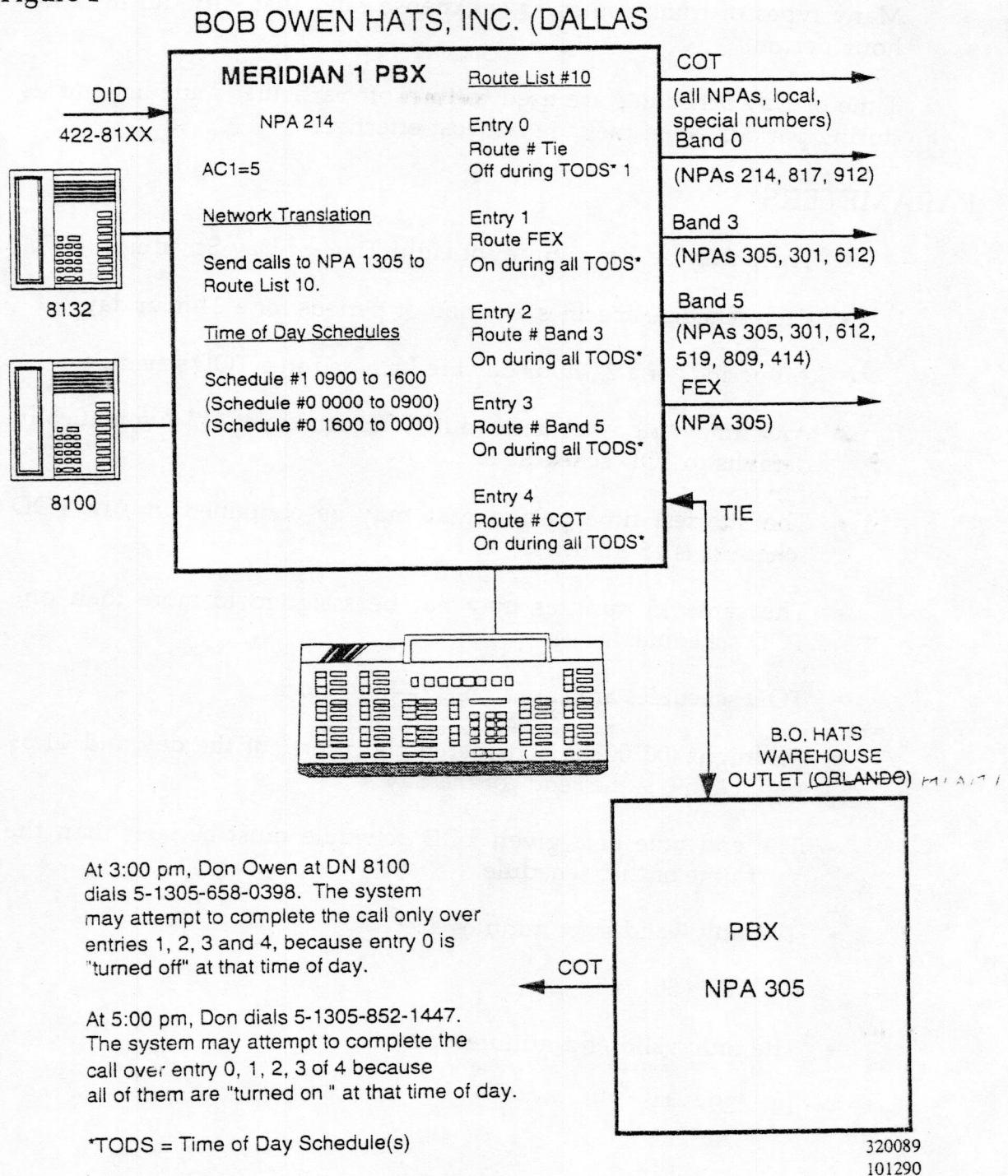
DEFINITION

BARS provides up to eight (0-7) Time-of-Day (TOD) schedules. Each entry in a route list references the TOD schedule(s) specifying the hour(s) during which the particular entry may be accessed. Thus, based on the current time of day, the most cost-effective route alternatives may be specified.

The example on the following page sets up the following scenario. It will be provisioned in another example in the provisioning section of this lesson:

Due to the amount of traffic on the COTs at the Orlando location (NPA 305) between the hours of 9:00 a.m. and 4:00 p.m., the telecommunications manager at Bob Owen Hats Inc. in Dallas wishes to prevent calls to the 305 NPA from being processed through the PBX in Orlando via the TIE trunks.

TODS Scenario
Figure 1



PURPOSE

Many types of trunk routes have expense rates that vary during a 24-hour period.

Time of Day Schedules are used to turn off particular route list entries during periods when they are not cost-effective.

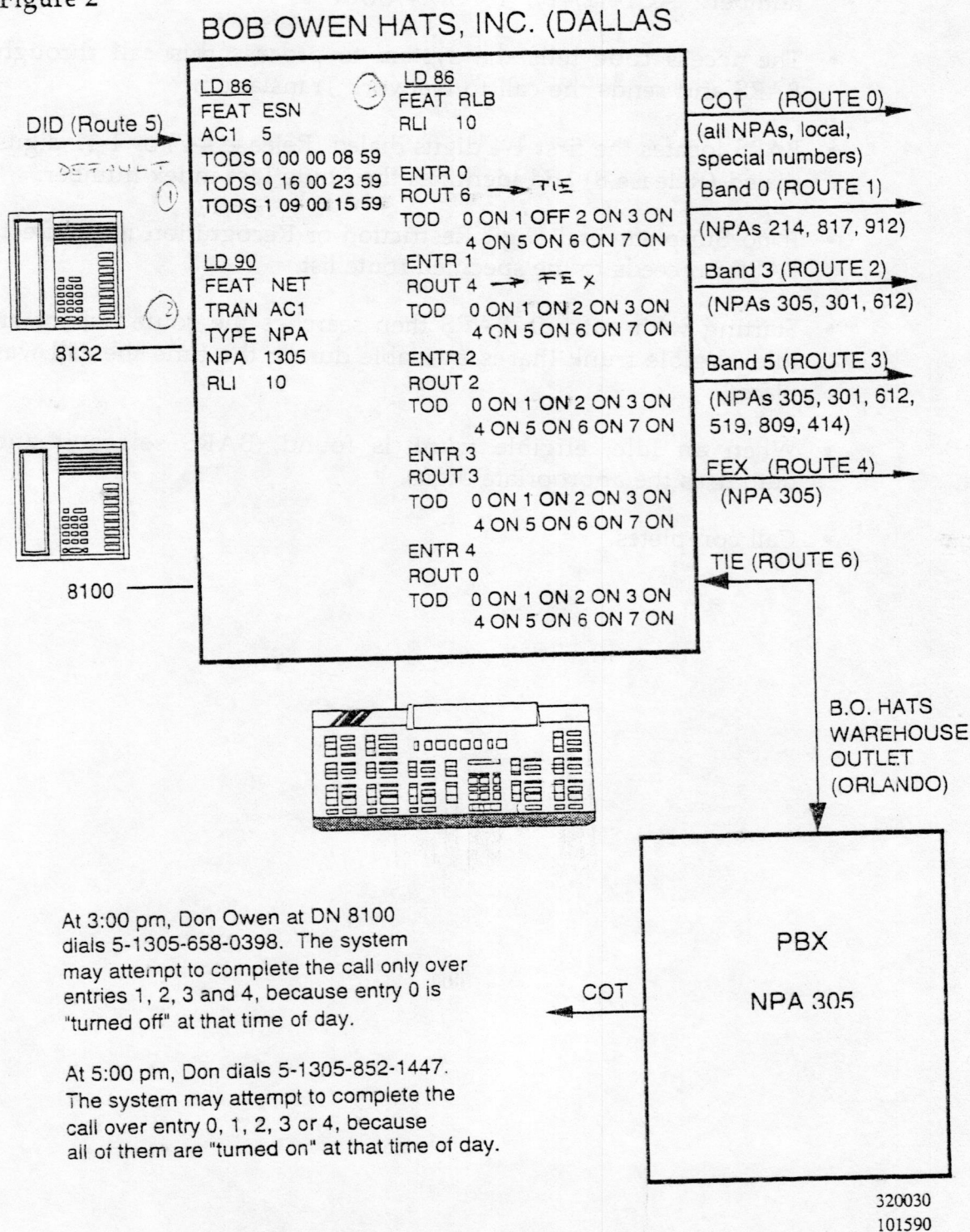
PARAMETERS

- There may be a maximum of eight Time-of-Day Schedules (0-7).
- Each schedule specifies a period or periods for a 24-hour day.
- All periods of a 24-hour day are included in a TOD schedule.
- Any time period not defined in TOD schedules 1-7 automatically defaults to TOD schedule 0.
- The shortest time period that may be contained in any TOD schedule is 15 minutes.
- The same 15 minutes may not be assigned to more than one TOD schedule.
- TOD schedules are based on a 24-hour clock.
- Midnight (00 00) is considered the "start" of the day and 11:59 p.m. (23 59) is the "end" of the day.
- The end time of a given TOD schedule must be later than the start time of that schedule.
- The only valid start minutes are:
00 15 30 45
- The only valid end minutes are:
14 29 44 59

TIME OF DAY SCHEDULES AND AUTOMATIC LEAST COST ROUTING SUMMARY

- A station user dials the BARS access code plus the desired number. AC1+(1)+NPA+NXX+XXXX
- The access code tells the system to process this call through BARS and sends the call to Network Translation.
- BARS locates the first 1-4 digits dialed (Release 4-7) or 1-11 digits dialed (Release 8) and identifies the Route List index number.
- If no Supplemental Digit Restriction or Recognition is in effect, BARS proceeds to the specified route list.
- Starting with entry 0, BARS then searches the route list for an idle, eligible trunk that is available during the time the call was placed.
- When an idle, eligible trunk is found, BARS seizes it and outpulses the appropriate digits.
- Call completes.

PROVISIONING TIME OF DAY SCHEDULES

TODS Scenario Provisioned
Figure 2

TIME OF DAY SCHEDULES FORMAT

The input format for Time of Day Schedules is divided into five fields:

s aa bb cc dd

- s - This field represents the TOD Schedule number. TOD Schedules may be numbered 0 through 7.
- aa - The hour that the TOD Schedule begins. The start hour may range from 00 to 23.
- bb - The minute the TOD Schedule begins. The four possible start minutes are 00, 15, 30 and 45.
- cc - The hour the TOD Schedule ends. The end hour may range from 00 to 23.
- dd - The minute the TOD Schedule ends. The four possible end minutes are 14, 29, 44 and 59.

TOD DEFAULT CHARACTERISTICS

Time-of-Day Schedules have four default characteristics:

OVERLAPPING SCHEDULES

If a new schedule includes any intervals included in an earlier schedule, the older schedule's end time automatically adjusts so that it ends one minute before the following schedule begins. The following is an example of overlapping schedules. The incorrect schedule shows how the times overlap, and the adjusted schedule shows how the schedule is adjusted by the system.

Example:

<u>Incorrect Schedule:</u>	<u>Adjusted Schedule</u>
TODS 1 00 00 07 59	TODS 1 00 00 06 59
TODS 2 07 00 10 59	TODS 2 07 00 10 59

Start times of both schedules remain the same.

INVALID START MINUTE

Defaults to next earlier valid start minute.

Valid start minutes are 00, 15, 30 and 45.

INVALID END MINUTE

Defaults to next-later valid end minute.

Valid end minutes are 14, 29, 44 and 59.

TODS 0

All periods of the 24-hour day not defined in TOD Schedules 1 through 7 automatically default to TODS 0.

Please use the TODS Worksheet on the following page to build TODS in the class. The steps for building TODS will follow the worksheet.

BUILDING TIME OF DAY SCHEDULES

<u>Route</u>	<u>Type</u>	<u>Parameters</u>
2	Band 5	Never to be used between 11pm and 8am
3	FEX	Never to be used between 12 noon and 2pm
4	TIE	Never to be used between 5pm and 8am

1. List all the times mentioned in order from earliest time in the day until the latest time in the day.

8:00

12:00

14:00

17:00

23:00

These now become your starting times.

2. Create ending times that correspond to one minute before the next starting time.

11:59

13:59

16:59

22:59

23:59

These now become your ending times.

3. Number the schedules, beginning with schedule 1. Remember, any time not accounted for will default to schedule 0.
4. Apply the schedule numbers to the applicable entries in the RLIs.

TIME OF DAY PRACTICE 1

<u>Route</u>	<u>Type</u>	<u>Parameters</u>
0	Two way cots	Not to be used between 7pm and 8am
1	Band 2 WATS	Not to be used between 11pm and 8am
3	FEX	Not to be used between 8pm and 11am

TODS	_____	_____	_____
TODS	_____	_____	_____
TODS	_____	_____	_____
TODS	_____	_____	_____
TODS	_____	_____	_____
TODS	_____	_____	_____

TIME OF DAY PRACTICE 2

<u>Route</u>	<u>Type</u>	<u>Parameters</u>
2	COTS	Not to be used between 10pm and 7:30am
3	Band 5 WATS	Not to be used between 11pm and 8am
4	Tie trunks	Not to be used between 8am and 12 noon

TODS	_____	_____	_____
TODS	_____	_____	_____
TODS	_____	_____	_____
TODS	_____	_____	_____
TODS	_____	_____	_____
TODS	_____	_____	_____

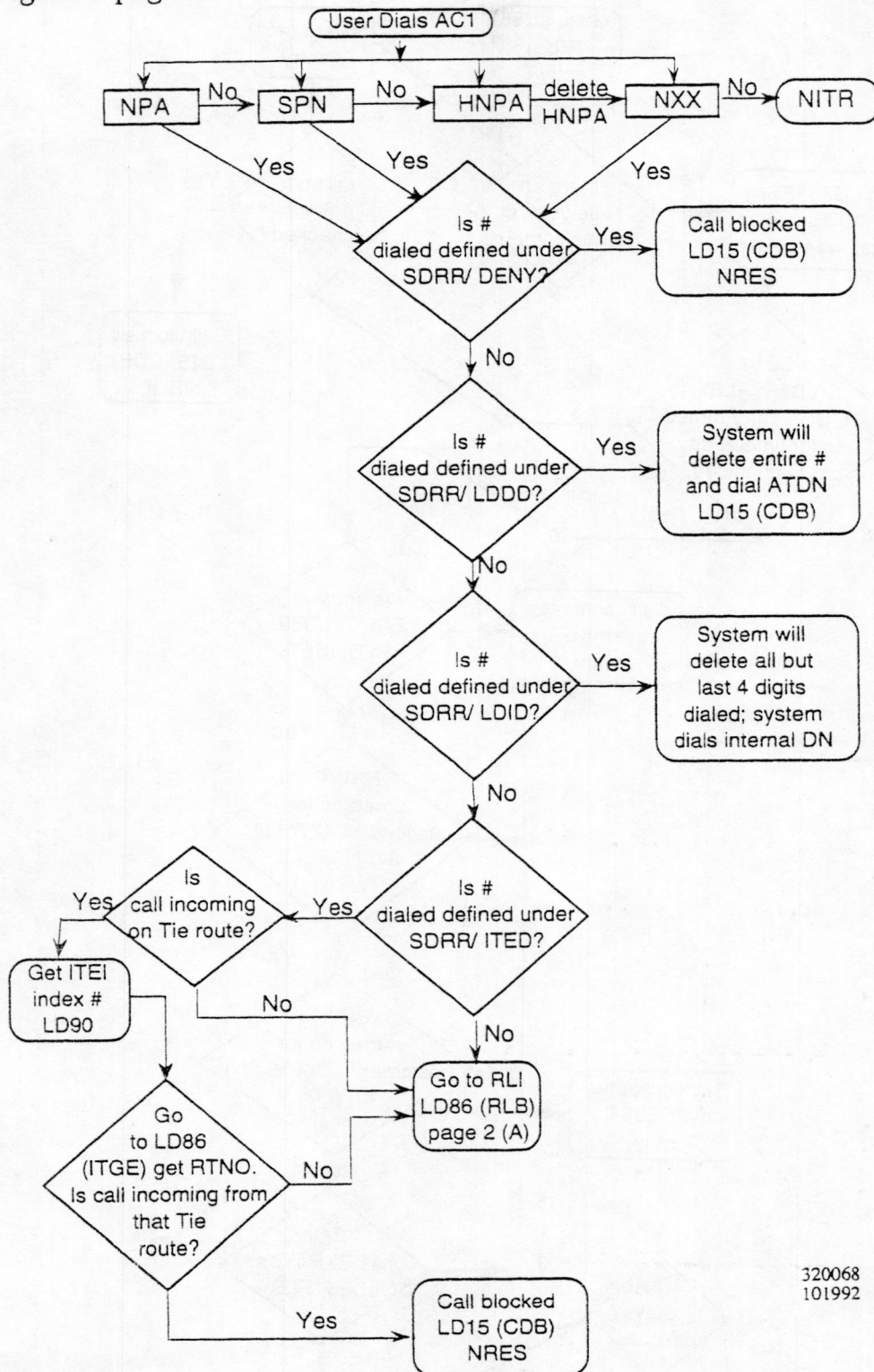
Network Intercept Treatment Chart
Figure 4

Network Intercept Treatment

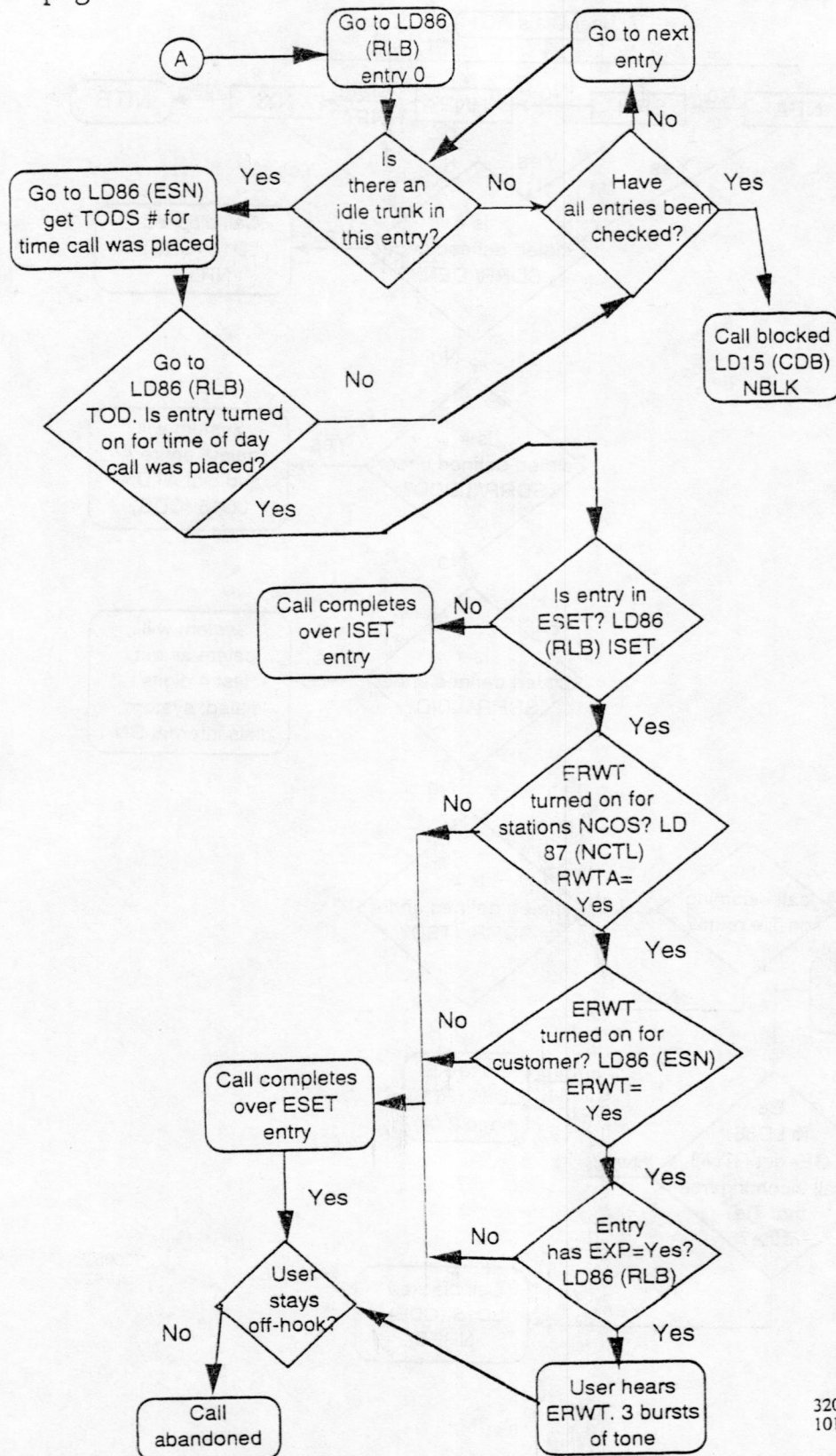
	Station or DISA	Attendant-Extended or Originated	Tie Trunk	DID	
NINV	(OVF) ATN RAN	(OVF) ATN RAN	(OVF) ATN RAN	OVF (ATN) RAN	No translation table No Network Control data block
NITR	(OVF) ATN RAN	(OVF) ATN RAN	(OVF) ATN RAN	OVF (ATN) RAN	Digit sequence dialed is not in translation table
NRES	(OVF) ATN RAN	(OVF) ATN RAN	(OVF) ATN RAN	OVF (ATN) RAN	Initial digit sequence located in translation table, but subsequent digit sequence blocked via SDRR
NBLK	(OVF) ATN RAN	(OVF) ATN RAN	(OVF) ATN RAN	OVF (ATN) RAN	Call blocked via: • All trunks busy • TOD • FCI • FRL

320058
100290

BARS Flowchart
Figure 5 page 1



320068
101992

BARS Flowchart
Figure 5 page 2320071
101992

SUMMARY

In this lesson, you learned that the purpose of Time of Day Schedules was to restrict access to certain routes in a 24-hour period. You identified the parameters and limitations of TODS, and related them to ALCR. You identified the default characteristics of TODS, and the four steps necessary to build Time of Day Schedules.

Additionally, you answered some interpretation questions regarding Time of Day Schedules, and you were able to provision a Time of Day Schedule for a customer. With the use of your NTPs, you will be able to identify the prompts and responses necessary to provision TODS, and you will be able to do so with complete accuracy.

MODULE 10

DIGIT MANIPULATION

INTRODUCTION

Sometimes the number dialed by a station user is not acceptable to the trunk over which the call is to be routed. This module describes and provisions Digit Manipulation tables and shows how they are used to insert or delete digits necessary to change the dialed number to a number that is acceptable.

OBJECTIVE

Given the Student Guide and class notes, the student should be able to:

- Identify the definition of Digit Manipulation.
- Identify the purpose, parameters and limitations of Digit Manipulation.

DEFINITION

Several types of trunk routes with different dialing requirements may be combined in a single route list. However, when certain trunk types are accessed, the digits dialed by the station user must be manipulated to conform to the dialing requirements of the trunk. BARS uses Digit Manipulation tables to modify the dialed digits, producing a number that is acceptable to the facility over which the call is to be routed.

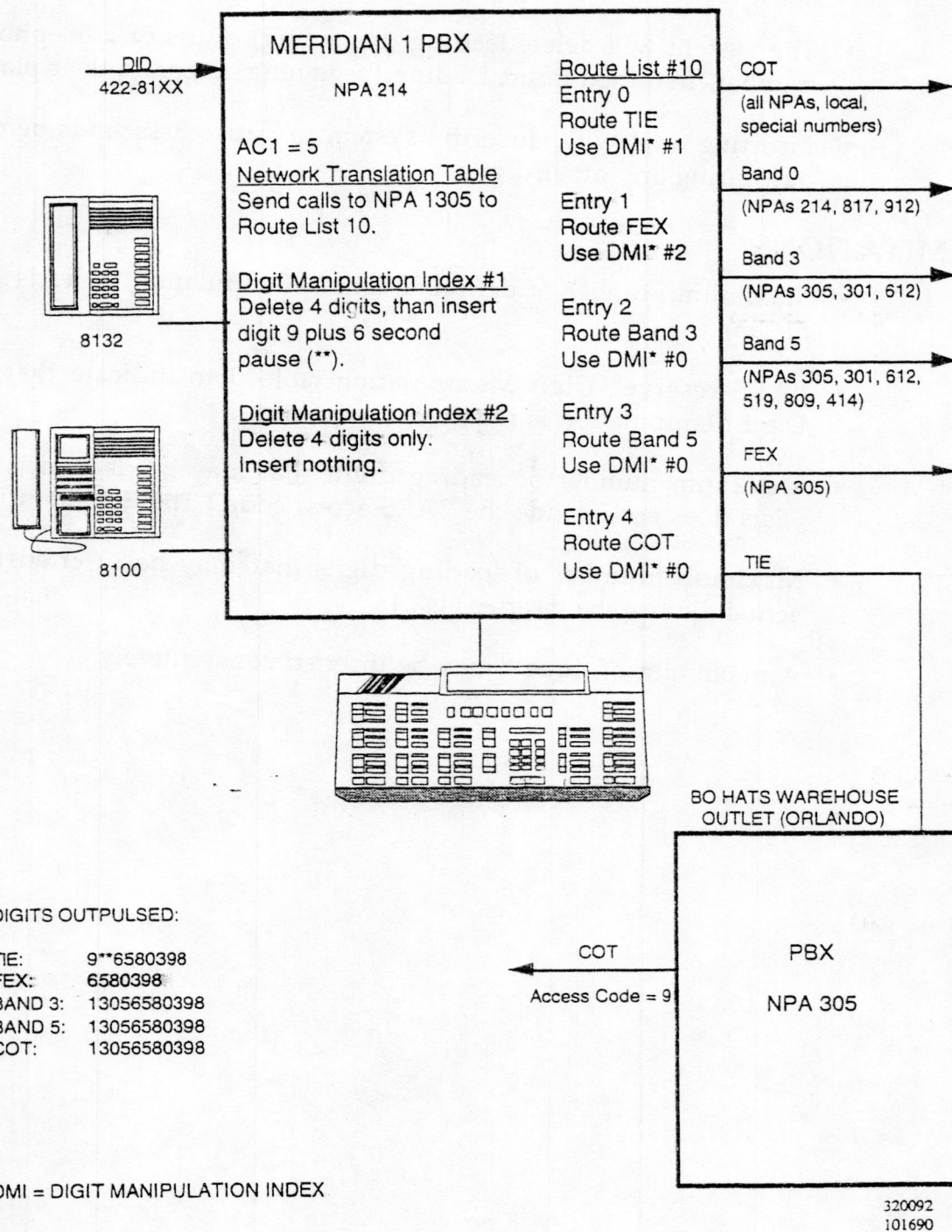
The scenario on the following page shows how dialing a telephone number for Bob Owens Hats, Inc. (Dallas) is described for Digit Manipulation. You will see how this scenario has been provisioned later in this lesson.

Digit Manipulation Scenario

Figure 1

DON OWEN at DN 8100 dials 5-1-305-658-0398.

BOB OWEN HATS, INC. (DALLAS)



PARAMETERS

- Digit Manipulation tables are referenced by each entry in a route list.
- Only one Digit Manipulation table may be referenced per entry.
- Digits may be deleted and/or inserted.
- The system will delete leading (beginning) digits of a telephone number first, then insert leading (beginning) digits in their place.
- Inserting an * will cause the system to pause 3 seconds before outputting any other digits.

LIMITATIONS

- Maximum number of definable Digit Manipulation tables is 256 (0-255).
- BARS reserves Digit Manipulation table 0 to indicate that no Digit Manipulation is required on an entry.
- Maximum number of leading digits that may be deleted is 15. (This does not include the BARS access code.) The default is "0".
- Maximum number of leading digits that may be inserted (the actual digits to be inserted) is 24.
- A maximum of three * may be inserted consecutively.

DIGIT MANIPULATION AND AUTOMATIC LEAST COST ROUTING

A station user dials the BARS access code, plus the desired telephone number. AC1+(1)+NPA+NXX+XXXX.

The access code tells the system to process this call through BARS and sends the call to network translation.

BARS locates the first 1-4 digits dialed (Release 4-7) or 1-11 digits dialed (Release 8) and identifies the route list index number.

If no Supplemental Digit Restriction or Recognition is in effect, BARS proceeds to the specified route list.

Starting with entry 0, BARS searches the route list for an idle, eligible trunk that is available during the time the call was placed.

When an idle, eligible trunk is found, BARS seizes it.

BARS will check the Digit Manipulation table referenced by the entry.

If Digit Manipulation table 0 is referenced, BARS output pulses the digits dialed by the station user.

If any of the Digit Manipulation tables numbered 1-255 are referenced, BARS will delete the digits identified in the Digit Manipulation table, and insert the digits indicated in the Digit Manipulation table.

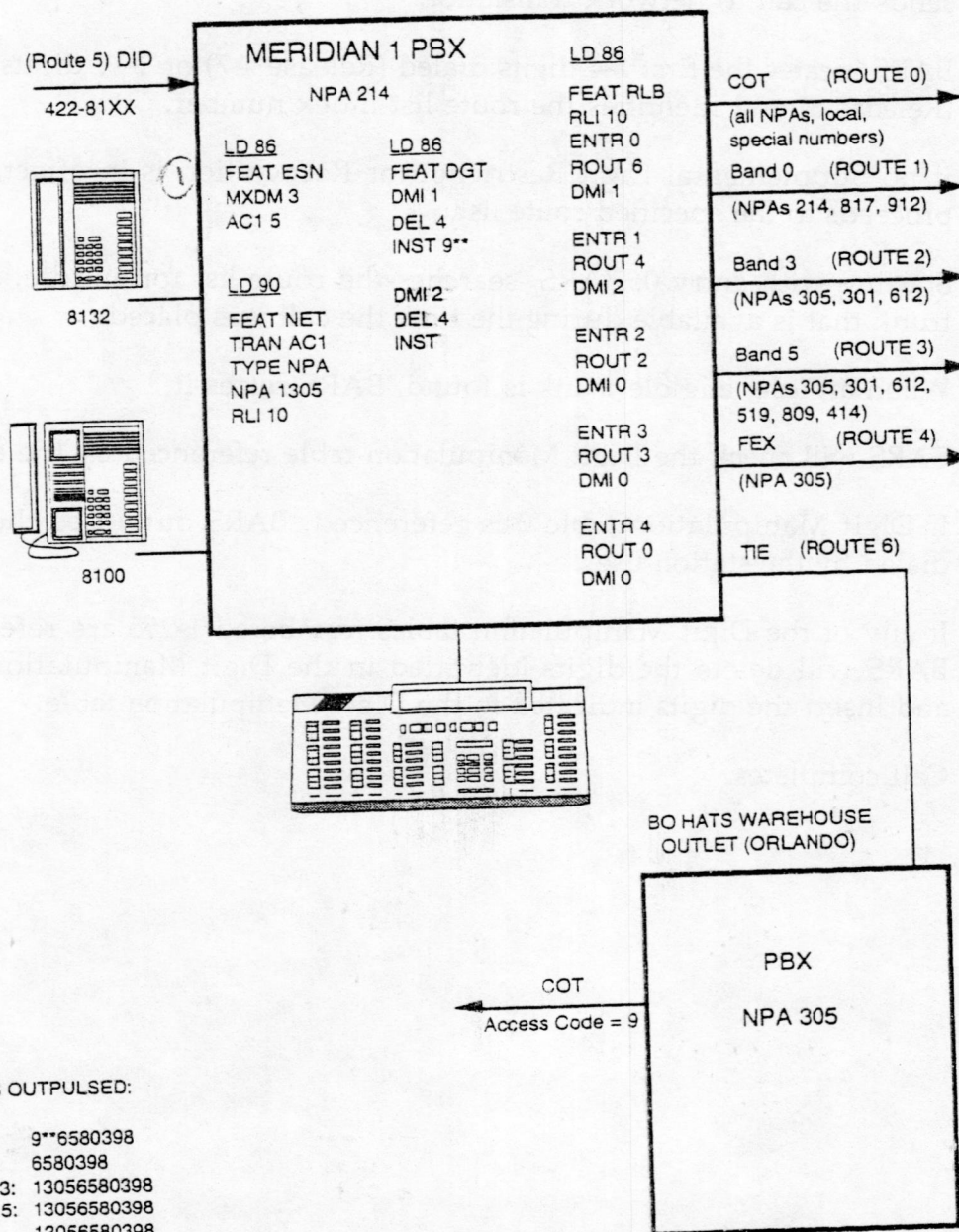
Call completes.

PROVISIONING DIGIT MANIPULATION

Digit Manipulation Scenario Provisioned Figure 2

DON OWEN at DN 8100 dials 5-1-305-658-0398.

BOB OWEN HATS, INC. (DALLAS)

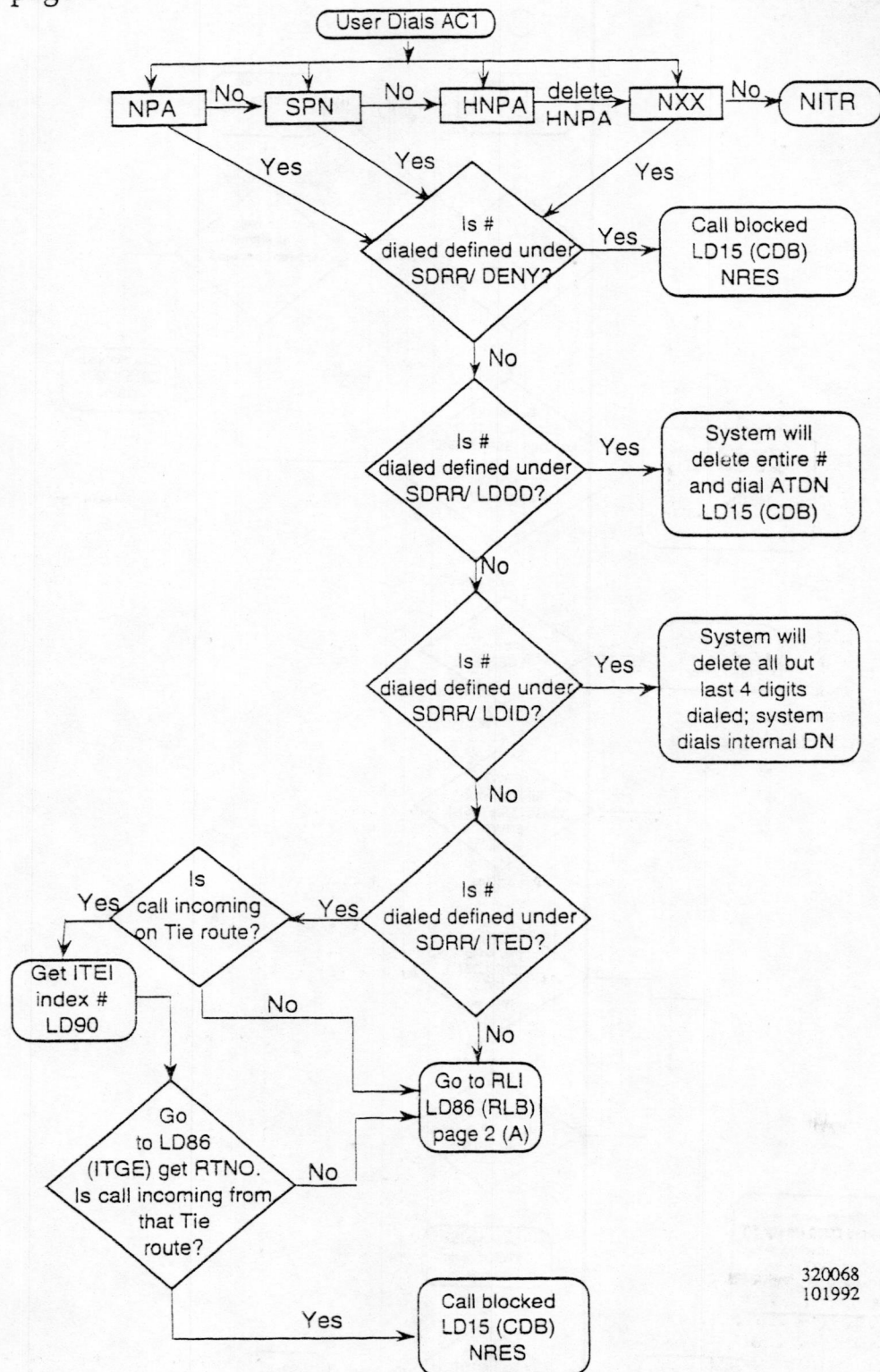


DIGITS OUTPUTSED:

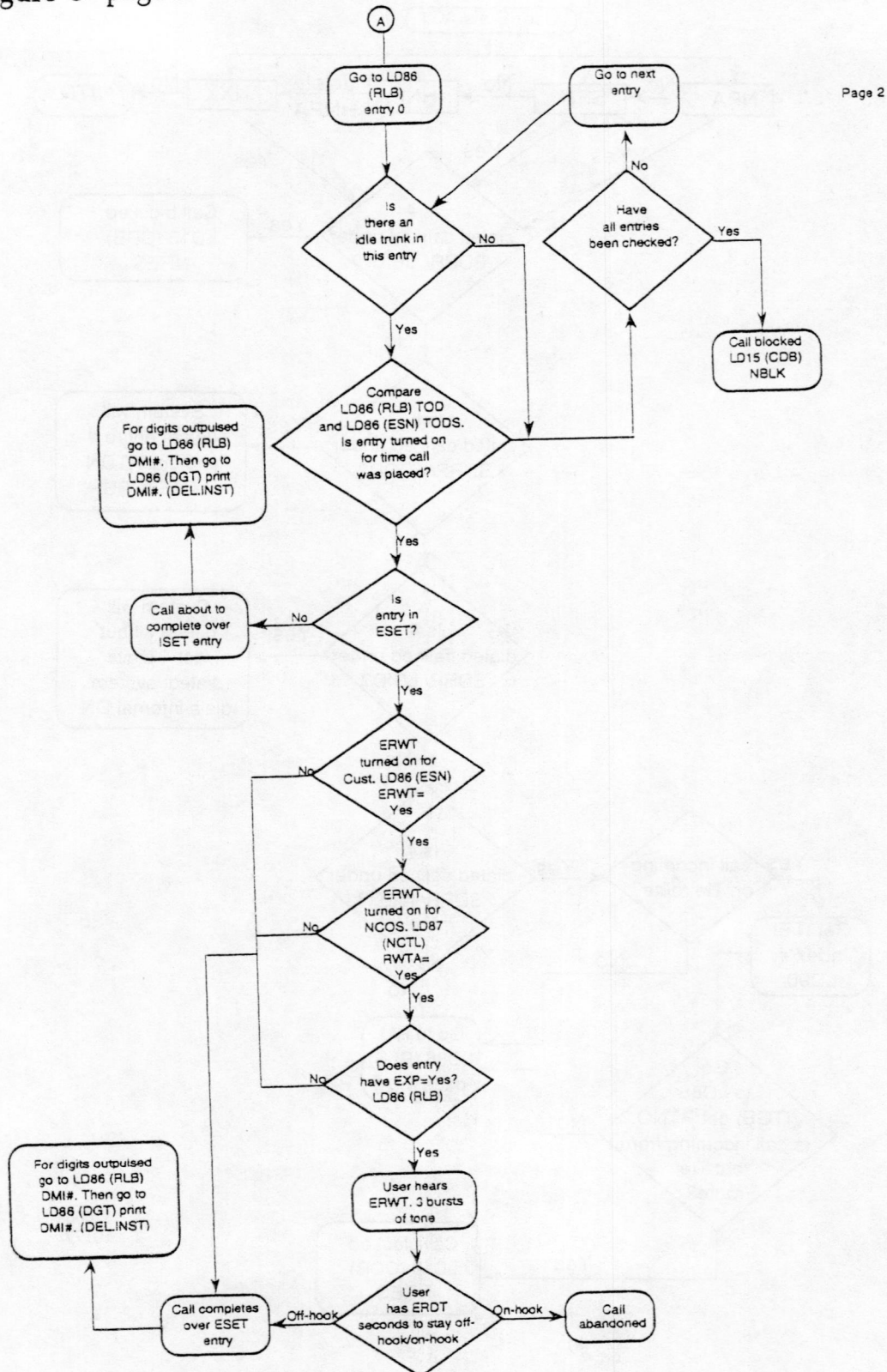
TIE: 9**6580398
FEX: 6580398
BAND 3: 13056580398
BAND 5: 13056580398
COT: 13056580398

320027
101590

BARS Flowchart
Figure 3 page 1



320068
101992

BARS Flowchart
Figure 3 page 2320072
101992

SUMMARY

In this lesson, you described Digit Manipulation as a service of BARS that determines when certain trunk types are accessed, the digits dialed by the station user are manipulated to conform to the dialing requirements of the trunk. BARS uses Digit Manipulation tables to modify the dialed digits to produce a number that is acceptable to the facility over which the call is to be routed. You described the parameters and limitations of Digit Manipulation, and you determined how to relate Digit Manipulation to ALCR.

Finally, you provisioned Digit Manipulation tables in class. Figure 3 also gave you a general flow of how Digit Manipulation works in your Meridian 1 switch with the other BARS services.

MODULE 11**FREE CALLING
AREA SCREENING**

INTRODUCTION

In contrast to Supplemental Digit Restriction, which denies specific numbers for the entire customer's BARS database, the Free Calling Area Screening (FCAS) feature allows or denies specific NXXs per NPA for individual route list entries. This module describes how the FCAS feature can be used to deny specific NXXs after an NPA is dialed on one route list entry while allowing those NXXs on another route list entry per NPA.

OBJECTIVE

Given the Student Guide and class notes, the student should be able to:

- Identify the correct definition and purpose of FCAS.
- Identify the parameters and limitations of FCAS.
- Identify the three intercept treatments provided if the user is denied access to entries because of the FCAS feature.

DEFINITION

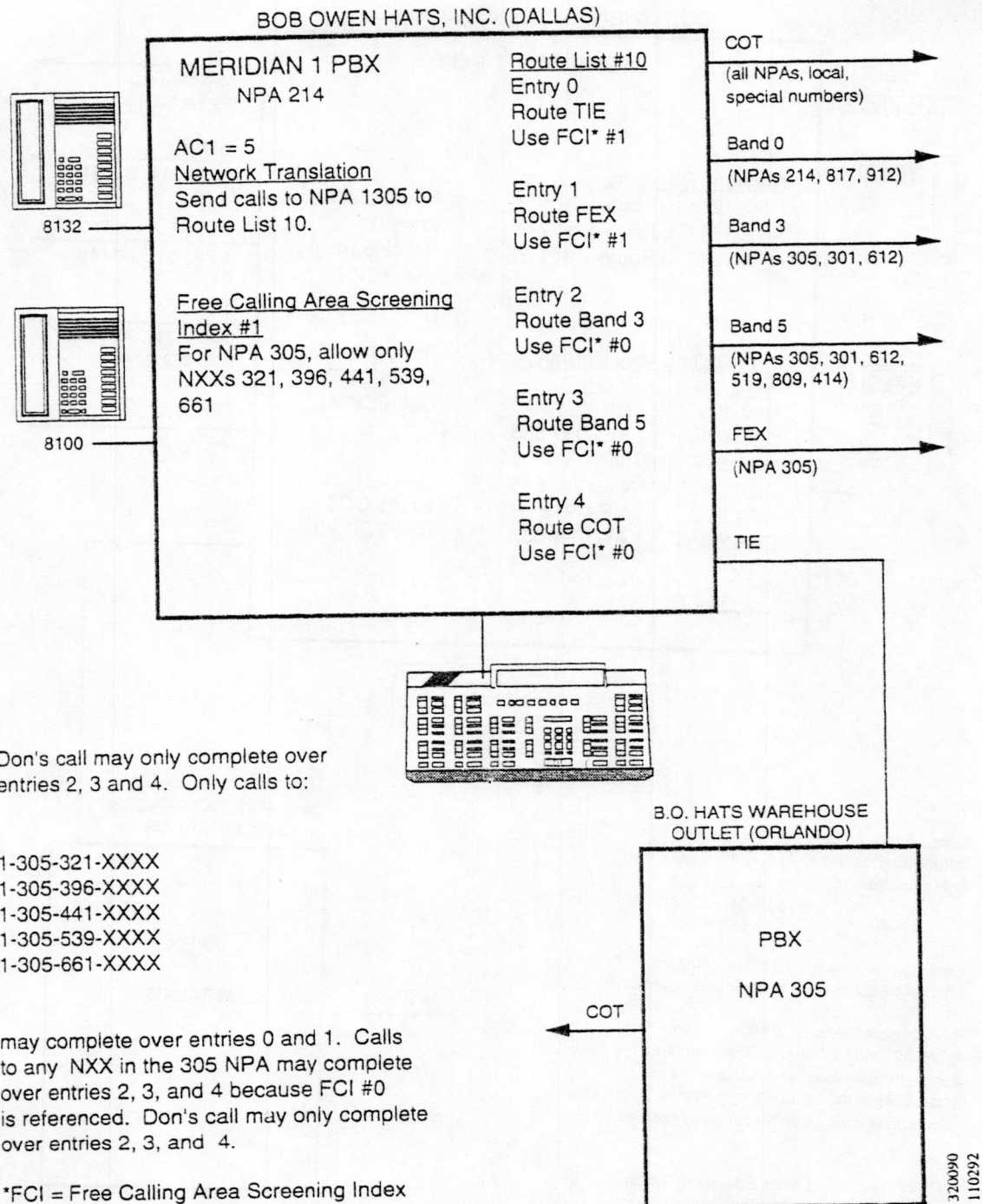
Free Calling Area Screening (FCAS) is a BARS feature that provides the customer with the capability of full six-digit (NPA-NXX) screening to determine the entry choice for completion of calls in the format AC1+(1)+NPA+NXX+XXXX. FCAS provides a way to deny an NPA+NXX on one entry in a route list while allowing the same NPA+NXX on another entry in a route list.

On the following pages, you will find two scenarios noting customer requirements for FCAS.

FCAS Scenario 1

Figure 1

Don Owen at DN 8100 dials 5-1305-658-0398. The TIE and FEX facilities will function most cost effectively if only used to serve NXXs 321, 396, 441, 539 and 661 within the 305 NPA (NXXs local to the PBX in Orlando).



PURPOSE

1. To allow calls in format of (1)+NPA+555+1212 to be routed over COTs only.
2. To allow NXX codes within the free calling area surrounding a particular FEX or TIE trunk, and restrict (deny) calls to those NXX codes that would incur long distance charges to a particular FEX or TIE.
3. To deny NXX codes to be routed over an OCC trunk when it is more cost-effective to route those calls over other facilities (WATS, COT, FEX).

PARAMETERS

- FCAS only applies to calls in the format (1)+NPA+NXX+XXXX.
- FCAS tables are referenced by each route list entry.
- Only one FCAS table may be referenced per entry.
- If an FCAS table allows NXXs, only those NXXs will be allowed to route over the entry. Any NXXs not listed will be denied.
- If an FCAS table denies NXXs, only those NXXs will be denied over the entry. Any NXXs not listed would be allowed.

LIMITATIONS

- Maximum number of FCAS tables per customer is 128. (256 with Rls. 19+).
- Maximum number of NPAs per table is 7 (15 with Rls. 19+).
- Maximum number of NXXs per NPA is 800.
- BARS reserves FCAS table 0 to indicate no Free Calling Area Screening is required for an entry.

FREE CALLING AREA SCREENING AND AUTOMATIC LEAST COST ROUTING

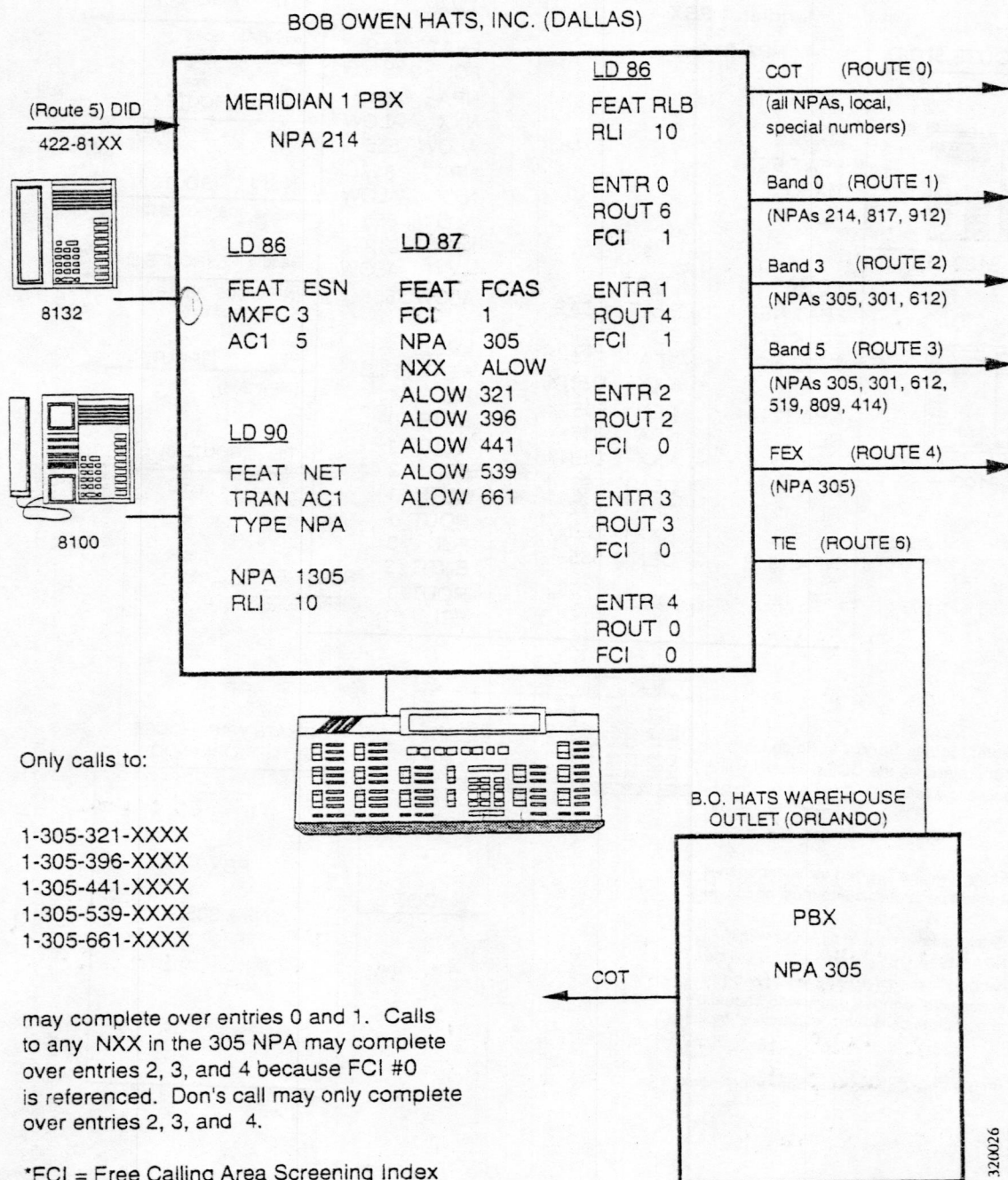
1. A station user dials the BARS access code plus the desired number. AC1+(1)+NPA+NXX+XXXX.
2. The access code tells the system to process this call through BARS and sends the call to network translation.
3. BARS locates the first 1-4 digits dialed (Release 4-7) or 1-11 digits dialed (Release 8) and identifies the route list index number.
4. If no Supplemental Digit Restriction or Recognition is in effect, BARS proceeds to the specified route list.
5. Starting with entry 0, BARS searches the route list for:
 - An idle trunk
 - An entry that is turned on for the time the call was placed
 - An entry that allows the NXX dialed
6. When an idle, eligible trunk is found, BARS seizes it. If no eligible trunk is found, flexible intercept treatment is provided by NBLK.
7. BARS checks the Digit Manipulation table referenced by the entry and performs Digit Manipulation on the dialed number.
8. Call completes.

PROVISIONING FREE CALLING AREA SCREENING

FCAS Scenario 1 Provisioned

Figure 3

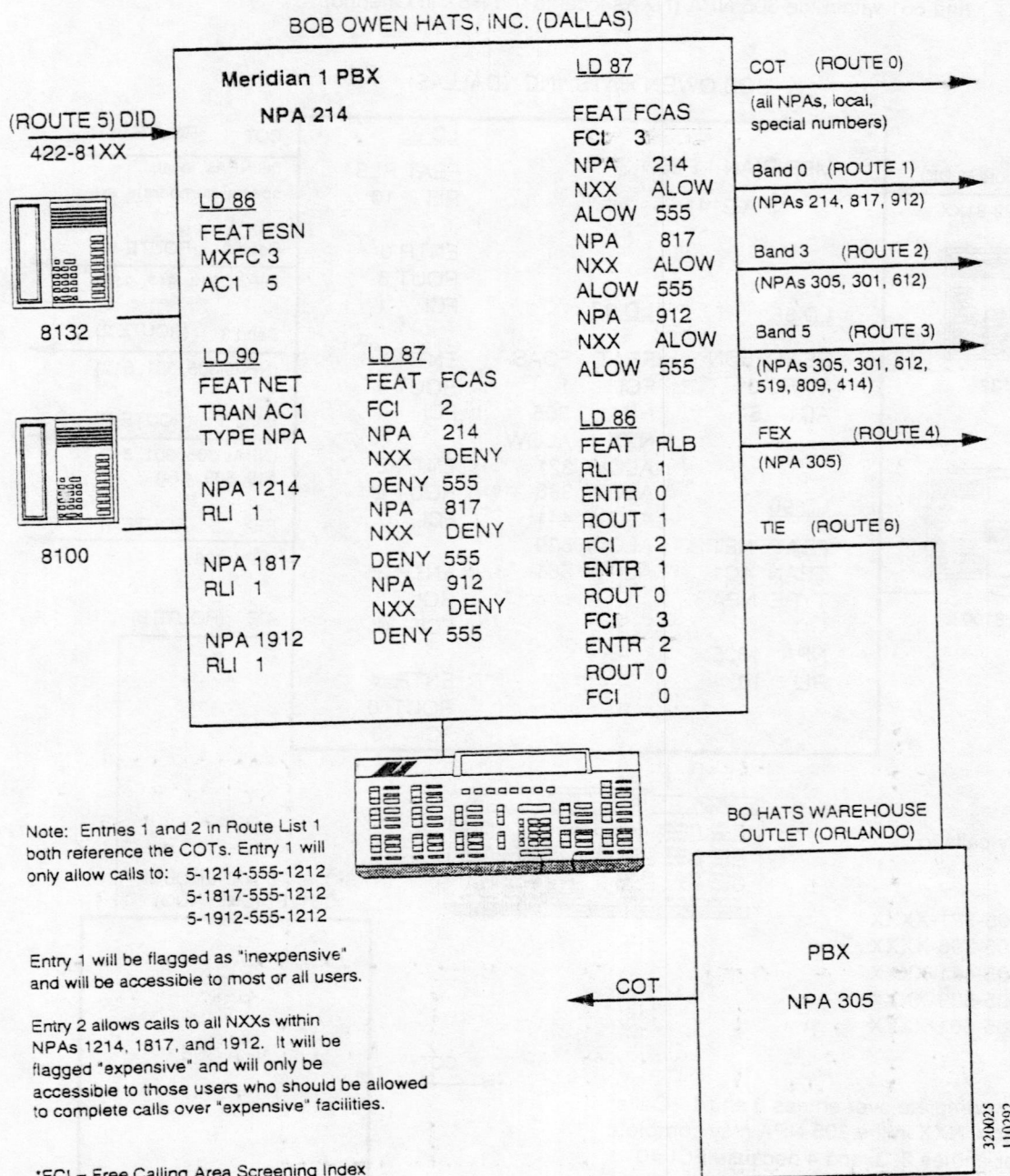
Don Owen at DN 8100 dials 5-1305-658-0398. The TIE and FEX facilities will function most cost effectively if only used to serve NXXs 321, 396, 441, 539 and 661 within the 305 NPA (NXXs local to the PBX in Orlando).



FCAS Scenario 2 Provisioned

Figure 4

Mr. Bob Owen, president of Bob Owen Hats Inc., wishes to route directory-assistance (AC1+NPA+555-1212) calls over COTs only to increase the possibility that more expensive, time consuming calls will be routed over more cost-effective facilities.



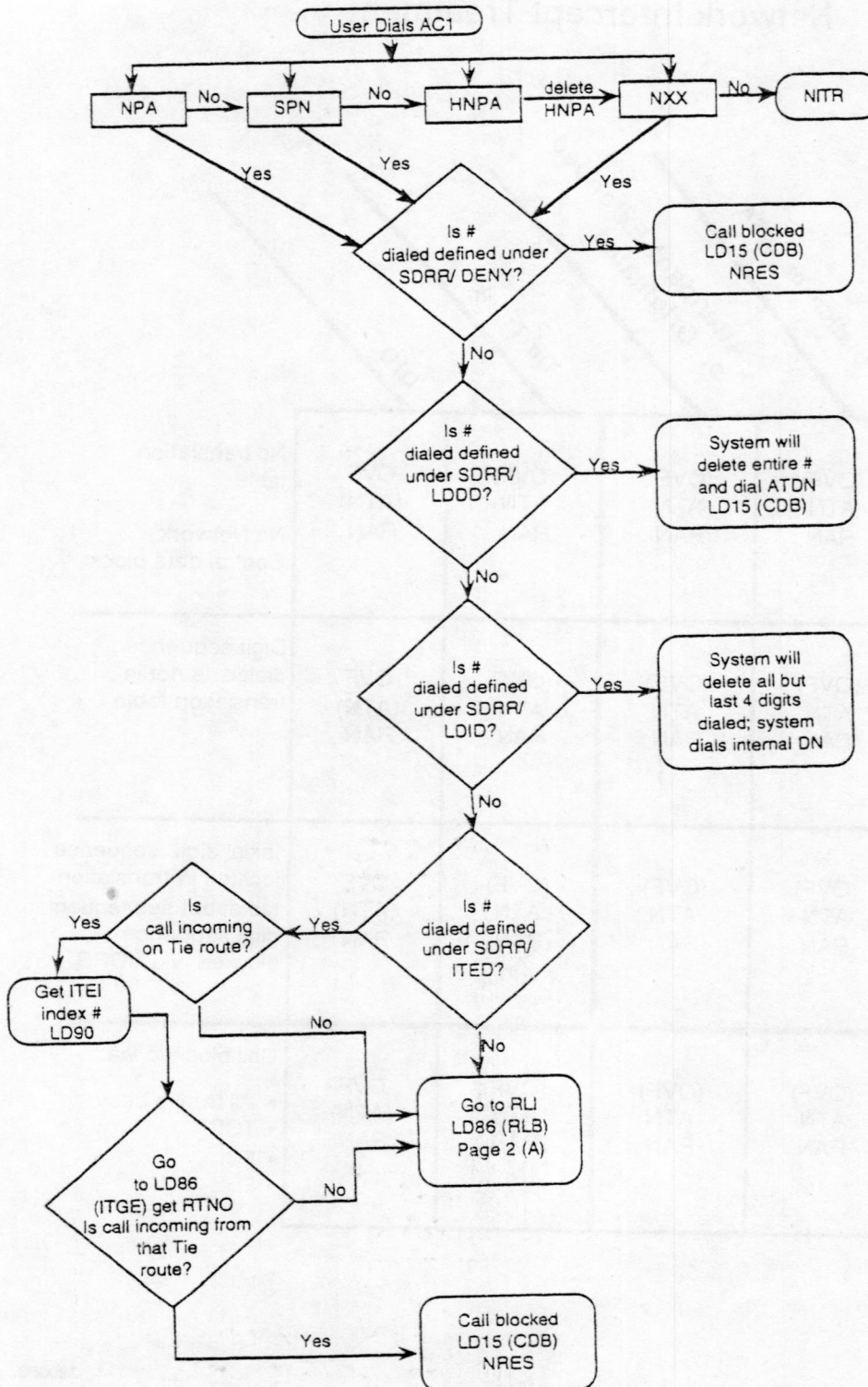
Network Intercept Treatment Chart
Figure 5

Network Intercept Treatment

	Station or DISA	Attendant-Extended or Originated	Tie Trunk	DID	
NINV	(OVF) ATN RAN	(OVF) ATN RAN	(OVF) ATN RAN	OVF (ATN) RAN	No translation table No Network Control data block
NITR	(OVF) ATN RAN	(OVF) ATN RAN	(OVF) ATN RAN	OVF (ATN) RAN	Digit sequence dialed is not in translation table
NRES	(OVF) ATN RAN	(OVF) ATN RAN	(OVF) ATN RAN	OVF (ATN) RAN	Initial digit sequence located in translation table, but subsequent digit sequence blocked via SDRR
NBLK	(OVF) ATN RAN	(OVF) ATN RAN	(OVF) ATN RAN	OVF (ATN) RAN	Call blocked via: • All trunks busy • TOD • FCI • FRL

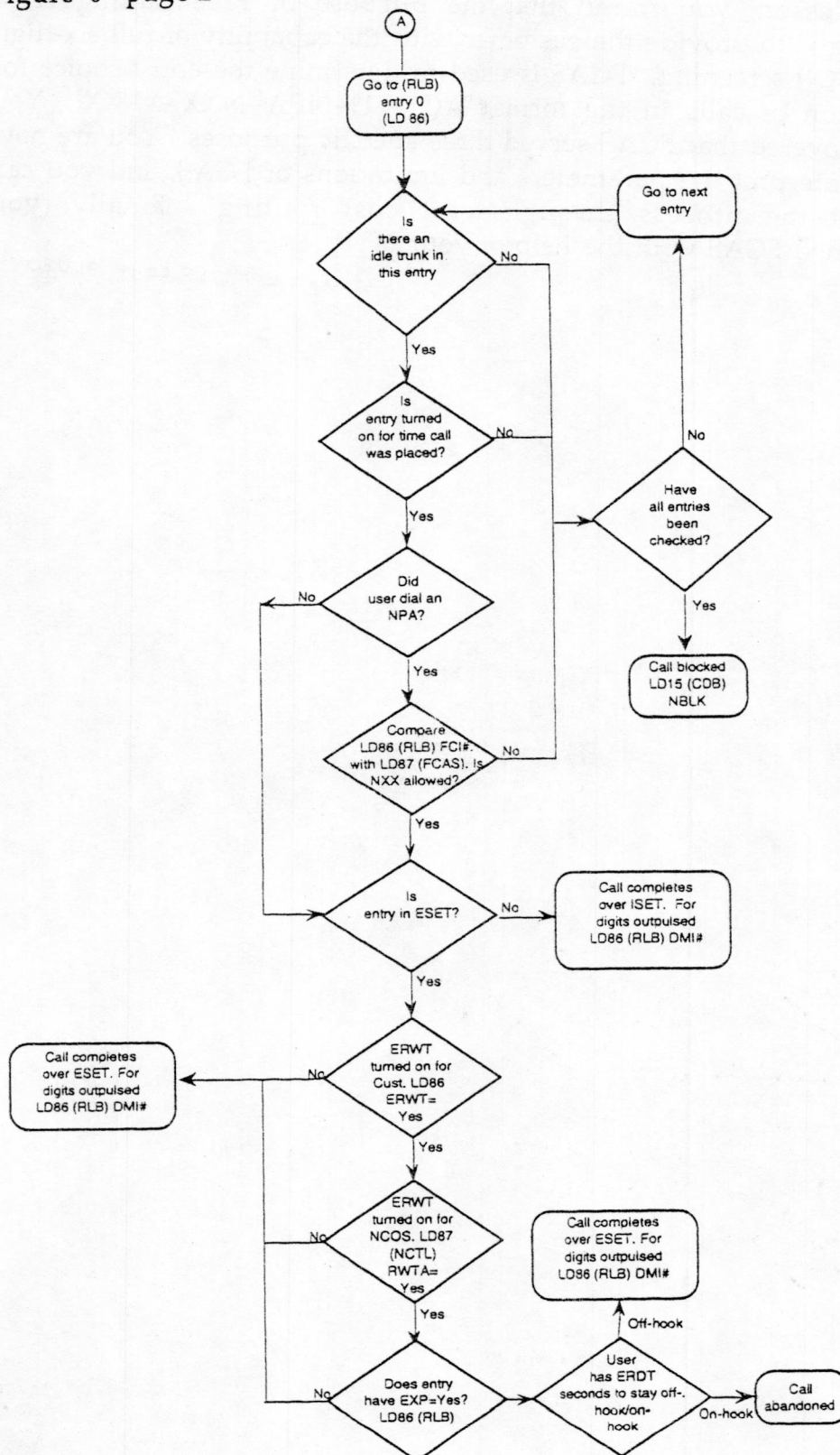
320058
100290

BARS Flowchart
Figure 6 page 1



320068
100890

BARSFlowchart
Figure 6 page 2



SUMMARY

In this lesson, you found that the purpose of Free Calling Area Screening is to provide the customer with the capability of full six-digit (NPA-NXX) screening. FCAS is used to determine the entry choice for completion of calls in the format AC1+(1)+NPA+NXX+XXXX. You also discovered that FCAS served three specific purposes. You are now able to interpret the parameters and limitations of FCAS, and you can interpret the process through least cost routing. Finally, you provisioned FCAS with the help of your NTPs.

NETWORK TELECOM PUBLICATION

MODULE 12**NETWORK CLASS
OF SERVICE**

INTRODUCTION

This module describes the prompts and possible responses required to provision Network Class of Service (NCOS). NCOS is provisioned in the overlay program 87, but programs 10, 11, 14, 18, 24 and 86 will also be used to provision the parameters associated with NCOS.

OBJECTIVE

Given the Student Guide and class notes, the student should be able to:

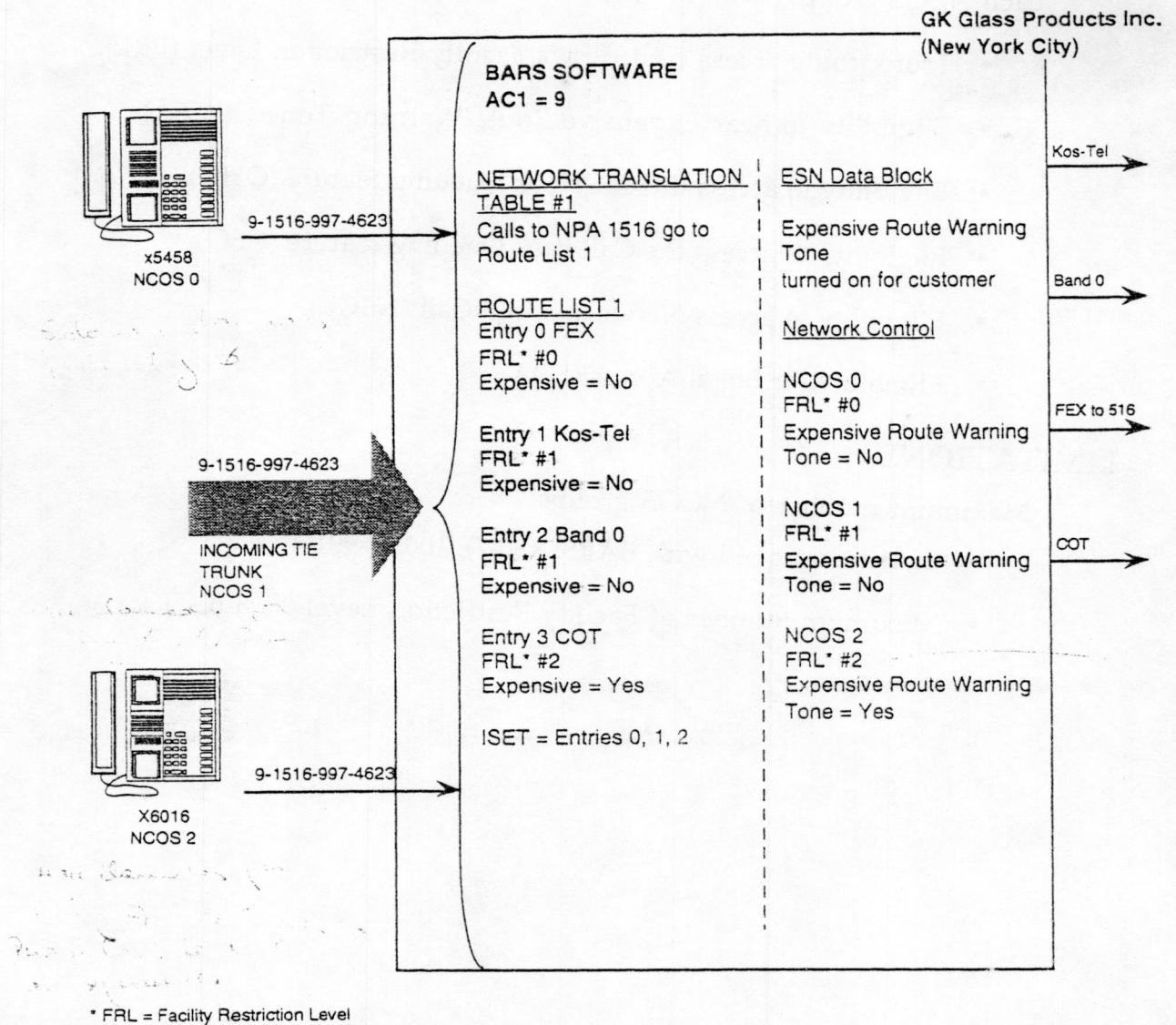
- Identify the correct definition of NCOS.
- List the parameters and limitations of NCOS.]
- Identify how the Facility Restriction Level (FRL) interacts with BARS software.
- Identify the three possible intercepts treatments provided if a user is denied access to entries in a Route List because of FRL.

DEFINITION

Network Class of Service is a means of dividing BARS users into groups with different trunk route access restrictions and characteristics. An NCOS will be assigned to each set and incoming or two-way Tie trunk in the system.

The example on the following page demonstrates how NCOS parameters are provisioned for GK Glass Products Inc.

GK Glass Products Inc. NCOS Scenario Figure 1



320059
100490

PARAMETERS

There are six network access characteristics that work together to define each NCOS group:

- Trunk route access control, via Facility Restriction Level (FRL).
- Eligibility to hear Expensive Route Warning Tone (RWTA).
- Eligibility to access the Off-Hook Queuing feature (OHQ).
- Eligibility to access the Call Back Queuing feature (CBQ).
- Eligibility to access Network Speed Call (NSCL).
- Eligibility for Equal Access (EQA).

LIMITATIONS

Maximum number of NCOS groups:

- Switch equipped with BARS: 8 (0-7); 100 (0-99)¹³⁺.
- Maximum number of Facility Restriction Levels is 8 (0-7).

FACILITY RESTRICTION LEVEL DEFINITION

Associated with each NCOS group is a Facility Restriction Level (FRL) number that ranges from 0 to 7. The FRL is used by the Meridian 1 software to determine the entries in a route list to which a station user has access.

FACILITY RESTRICTION LEVEL PARAMETERS

- Facility Restriction Levels (FRL) are numbered 0-7.
- FRL 0 has the lowest access.
- FRL 7 has the highest access.
- An FRL number will be assigned to each NCOS.
- An FRL number will be assigned to each entry in a route list.
- For a user to access an entry in a route list, the FRL assigned to the user's NCOS must be equal to or greater than the FRL assigned to the entry in the route list.
- By convention, the FRL number is usually the same number as the NCOS.

EQUAL ACCESS DEFINITION

FCC Part 68 regulations require that any equipment or software manufactured or imported on or after April 17, 1992, and installed by any aggregator, must allow all users to use Equal Access codes to selectively access the long distance carrier of their choice. An aggregator is any business that, in the ordinary course of operations, makes telephones available to the public or to transient users of the premises. Aggregators include hotels or motels, hospitals, universities and airports.

Aggregators, although they must allow callers access to any long distance call, are permitted to block calls selectively. Selective equal access lets aggregators choose to block direct-dialed calls that result in charges to the originating telephones. Aggregators cannot block operator-assisted calls.

EQUAL ACCESS PARAMETERS

X11 software supports Equal Access dialing on a per NCOS and per route basis in the following manners:

- Allows operator assisted North American and international dialing.
 - CAC (Carrier Access Code) + 0
 - CAC + 0 + NPA + NXX-XXXX
 - CAC + 01 + Country Code + National Number
- Allow or deny North American and international dialing.
 - CAC + 1 NPA + NXX-XXXX
 - CAC + 011 + CC + NN
- Equal access compliance supports COT, FEX, DID, and TIE routes.
- Call restriction relies on fixed pattern recognition to determine which calls can be denied. Switch administrators can restrict two kinds of direct-dialed Equal Access calls, CAC + 1 + NPA, and CAC + 011.

CARRIER ACCESS CODE EXPANSION

Prior to the first quarter of 1995, the CAC is defined as 10XXX, where '10' is the Equal Access identifier and XXX is the Carrier Identification Code (CIC). During the first quarter of 1995, Carrier Identification Code Expansion will occur. The CAC will become 101XXXX (an Equal Access identifier of '101', followed by a four digit CIC). For a period of approximately 18 months following the introduction of the new format, both old and new formats will be accepted. During 1996, support for the 10XXX format will terminate. Meridian 1 software permits both formats.

EXPENSIVE ROUTE WARNING TONE DEFINITION

Expensive Route Warning Tone alerts the caller that a route classified as expensive has been selected to complete the call. It provides the caller with the option of either accepting, aborting, or depressing the Ring Again key and entering the Call Back Queue for inexpensive entries. Expensive Route Warning Tone is three bursts of tone.

EXPENSIVE ROUTE WARNING TONE PARAMETERS

For a user to hear Expensive Route Warning Tone, all four of the following criteria must be met for the call:

- Expensive Route Warning Tone must be turned on for the customer.
- Expensive Route Warning Tone must be turned on for the station's NCOS.
- The entry the system has chosen for this call must be in the ESET.
- The entry the system has chosen for this call must be classified as expensive.

NCOS AND AUTOMATIC LEAST COST ROUTING

A station user dials the BARS access code plus the desired number. AC1+(1)+NPA+XXX+XXXX. The access code tells the system to process this call through BARS and sends the call to network translation. If no Supplemental Digit Restriction or Recognition is in effect, BARS proceeds to the specified route list. Starting with entry 0, BARS then searches the route list for:

1. An idle trunk.
2. An entry that is turned on for the time the call was placed (TODS).
3. An entry that allows the NXX dialed if the user first dialed an NPA (FCAS).
4. An entry that the user may access (via the Facility Restriction Level).

When an idle, eligible trunk is found, BARS checks Expensive Route Warning Tone. The following parameters should exist:

1. Expensive Route Warning Tone turned on for customer.
2. Expensive Route Warning Tone turned on for user's NCOS.
3. Entry is in ESET.
4. Entry is marked expensive.

LD 86
ESET
LD 82

If all four of the above parameters are met, the user hears Expensive Route Warning Tone. The user will have 2 to 10 seconds (customer-defined) to either:

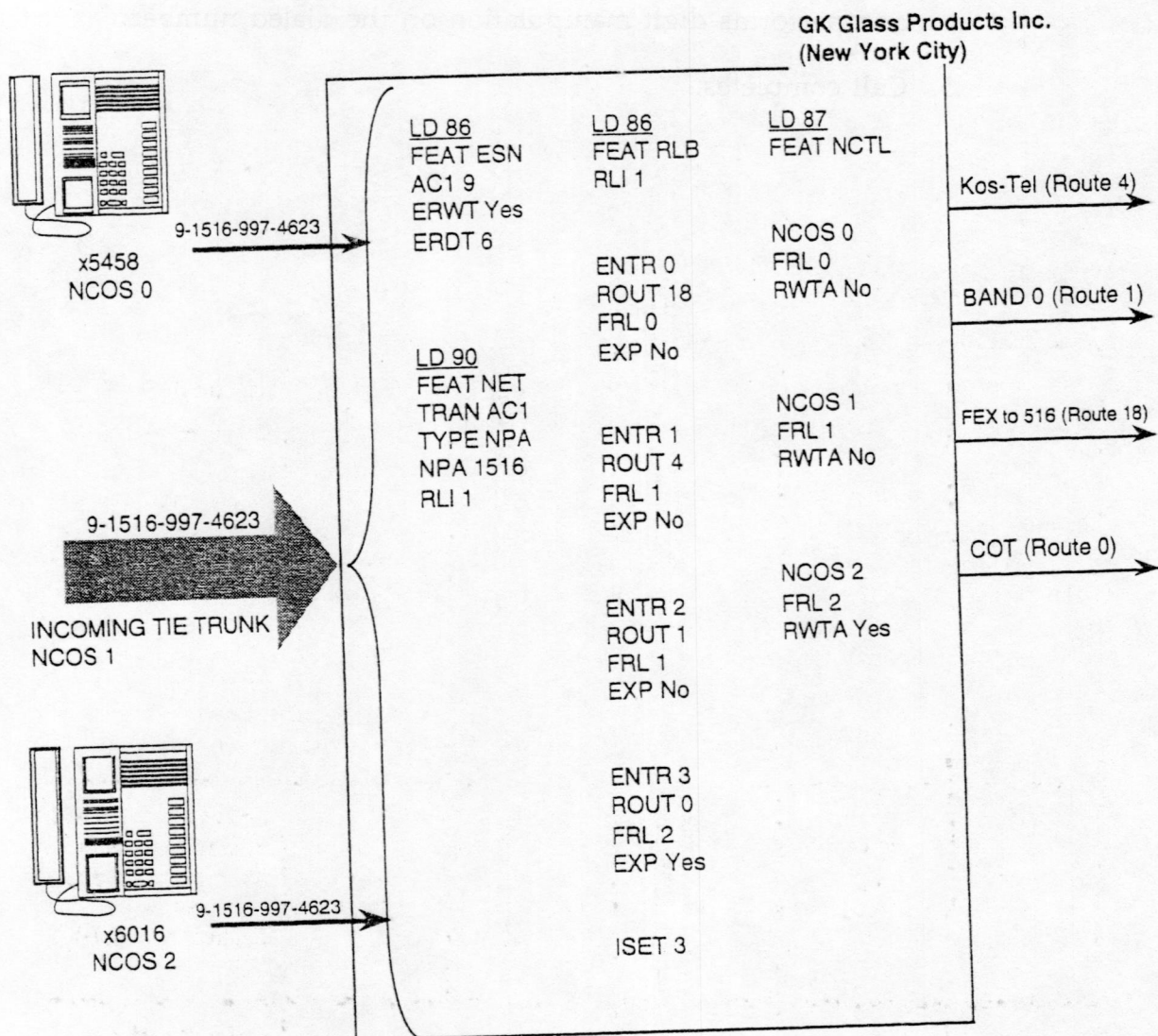
1. Hang up and try the call later.
2. Remain off-hook, allowing the call to complete over the expensive entry.
3. Depress Ring Again and queue for the inexpensive entries in the route list.

If any one of the four parameters is not met, the call completes over the expensive entry. The user will not hear Expensive Route Warning Tone.

4. BARS seizes the trunk, checks for a Digit Manipulation Table and performs digit manipulation on the dialed number.
5. Call completes.

PROVISIONING NETWORK CLASS OF SERVICE

GK Glass Products, Inc. NCOS Scenario Provisioned
Figure 2



*FRL = Facility Restriction Level

NCOS > FRL

320029
100390

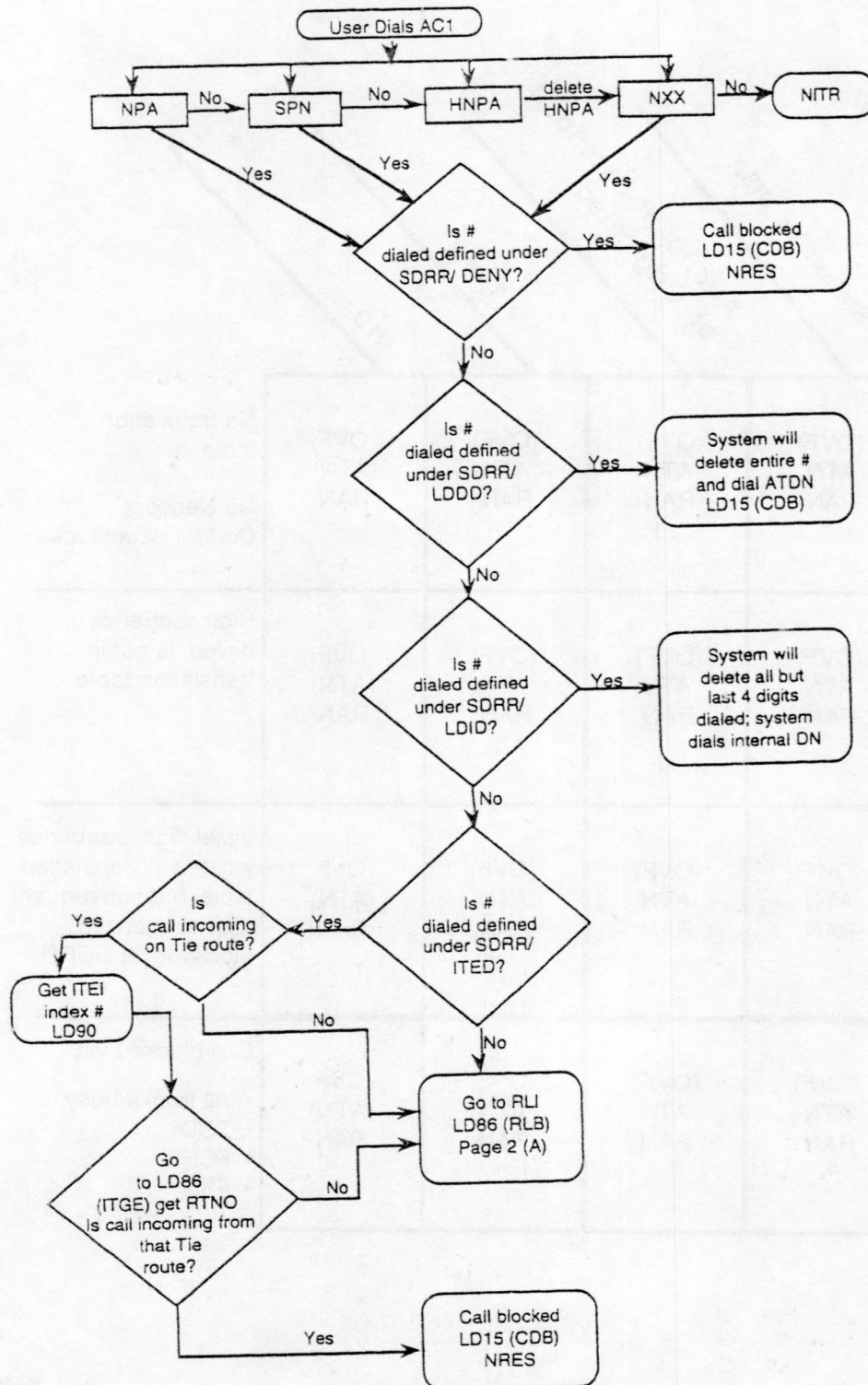
Network Intercept Treatment Chart
Figure 3

Network Intercept Treatment

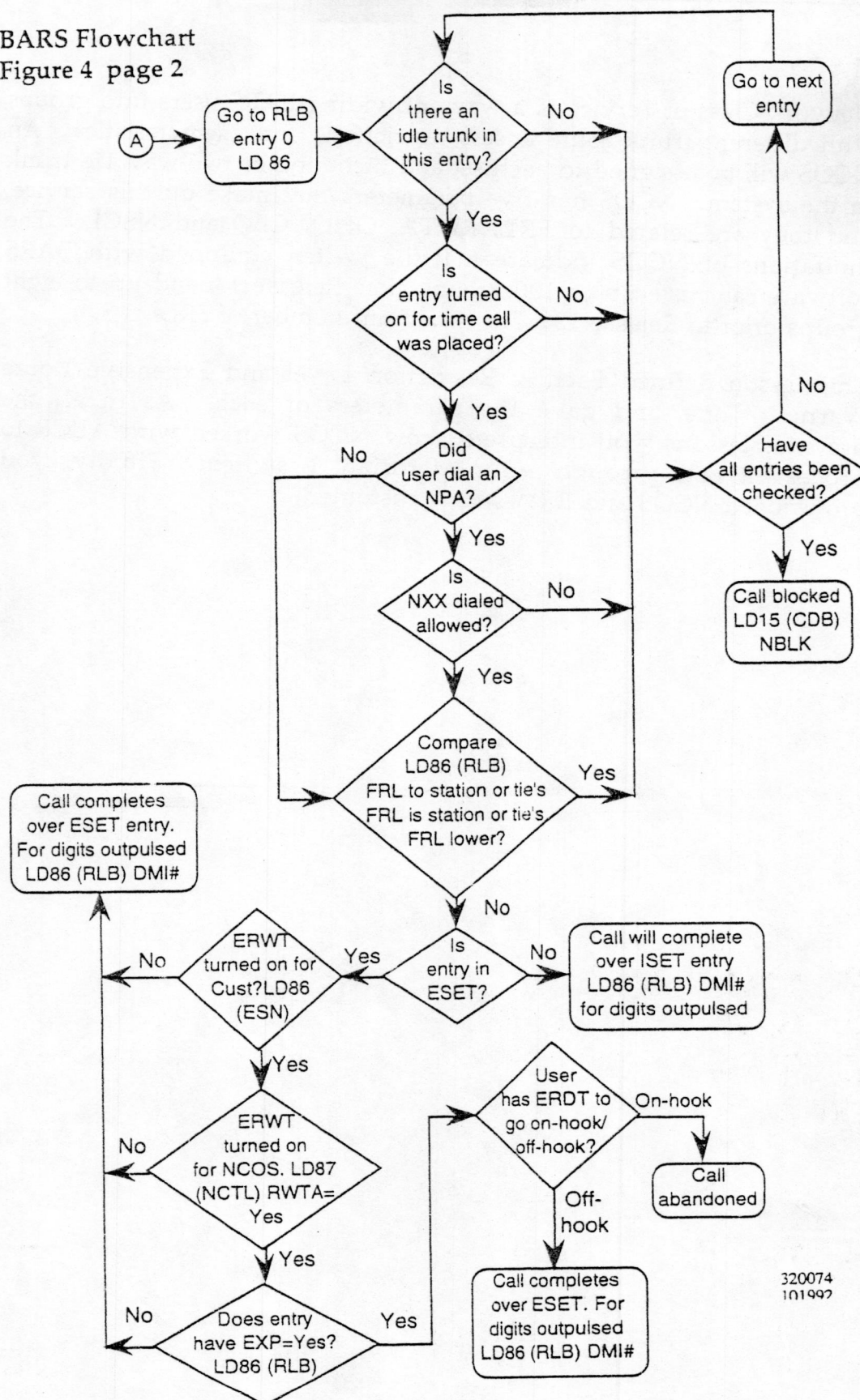
	Station or DISA	Attendant-Extended or Originated	Tie Trunk	DID	
NINV	(OVF) ATN RAN	(OVF) ATN RAN	(OVF) ATN RAN	OVF (ATN) RAN	No translation table No Network Control data block
NITR	(OVF) ATN RAN	(OVF) ATN RAN	(OVF) ATN RAN	OVF (ATN) RAN	Digit sequence dialed is not in translation table
NRES	(OVF) ATN RAN	(OVF) ATN RAN	(OVF) ATN RAN	OVF (ATN) RAN	Initial digit sequence located in translation table, but subsequent digit sequence blocked via SDRR
NBLK	(OVF) ATN RAN	(OVF) ATN RAN	(OVF) ATN RAN	OVF (ATN) RAN	Call blocked via: • All trunks busy • TOD • FCI • FRL

320058
100290

BARS Flowchart
Figure 4 page 1



320068
100890

BARS Flowchart
Figure 4 page 2

SUMMARY

Network Class of Service is a way of dividing BARS users into groups with different trunk route access restrictions and characteristics. An NCOS will be assigned to each set and incoming or two-way Tie trunk in the system. NCOS has five parameters that make up this service, and they are related to FRL, RWT, OHQ, CBQ and NSCL. The limitations of NCOS indicate that the switch equipped with BARS software can have up to 100 groups after Release 13, and up to eight groups prior to Release 13. The maximum number of FRLs is 8.

This lesson defined Facility Restriction Level and Expensive Route Warning Tone, and gave the parameters of each. As in all the previous lessons, you interpreted how NCOS worked with ALCR to process a call through your Meridian 1 switch. Finally, you provisioned NCOS and ERWT for a customer.

MODULE 13**ROUTING CONTROL**

INTRODUCTION

Sometimes there are portions of each day or entire days of the week when a customer wants to restrict or control a user's access to trunk routes. This lesson describes the Routing Control feature that can be used to develop alternate NCOS assignments for specific periods each day or the entire 24 hours of a day.

OBJECTIVE

Given the Student Guide and class notes, the student should be able to:

- Identify the correct definition of Routing Control.
- Identify the purpose and parameters of Routing Control.
- List the three ways that Routing Control can be invoked.
- Identify the Routing Control interactions.

DEFINITION

The Routing Control feature provides a way to reduce or increase a user's network access capabilities by changing the assigned NCOS level. NCOS levels may be increased or reduced (or remain the same) for specific time periods each day and/or the entire 24 hours of a day.

The graphic on the following page explains how Owen Memorial Teaching Hospital would like to control their routing.

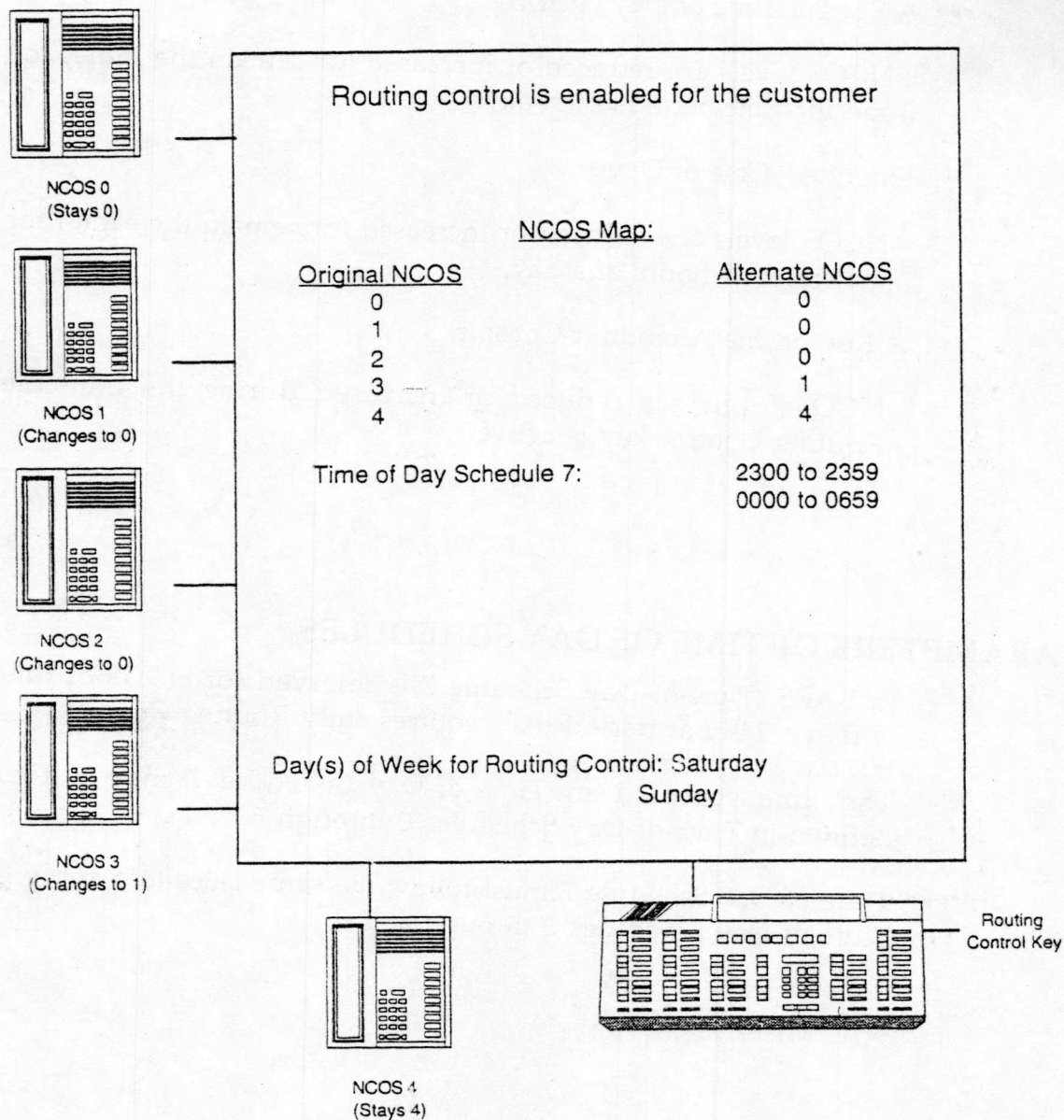
Owen Memorial Teaching Hospital's telecommunications department wishes to provide an alternate set of access characteristics for some of its users at the following times: every day from 11:00 p.m. to 7:00 a.m.; all day Saturday and Sunday; and during major disasters. The original NCOS assignments are:

NCOS:	Assigned to:	Permits:
0	Courtesy phones	Internal calls only
1	Patients	Internal and local
2	Administration	Internal, local and intrastate
3	Doctors	Internal, local, intrastate, all of U.S.
4.	Emergency Rooms	Full network access

During Routing Control, courtesy phones, patients, and administration should be allowed internal calling only; doctors should be allowed internal and local calling; and emergency rooms should continue to have full network access.

Owens Memorial Scenario

Figure 1



320060
100190

INVOKING ROUTING CONTROL

Routing Control may be invoked via:

- A Special Time of Day (TODS 7)
 - NCOS levels are reduced or increased (or remain the same) for specific time periods each day.
- Extended Time of Day
 - NCOS levels are reduced or increased (or remain the same) for the entire 24 hours of a day.
- A Key on the Attendant Console
 - NCOS levels are reduced or increased during the time the Routing Control key is active.

PARAMETERS OF TIME OF DAY SCHEDULES

- In BARS, Time-of-Day Schedule 7 is reserved for blocks of time within a 24-hour period that requires daily Routing Control.
- The time specified in Time-of-Day Schedule 7 may not be defined in Time-of-Day Schedules 0 through 6.
- Time-of-Day Schedule 7 must follow the same rules that apply to Time-of-Day Schedules 0 through 6.

PARAMETERS OF ROUTING CONTROL

The original set of NCOS numbers and corresponding set of alternate NCOS numbers are defined by an NCOS map.

The NCOS map (NMAP) lists each NCOS with an alternate NCOS assignment that replaces the original when Routing Control is in effect.

The alternate NCOS may have the same, lesser or greater value than the original NCOS.

ROUTING CONTROL AND BASIC AUTHORIZATION CODES

Basic authorization codes replace a user's network access characteristics, even when Routing Control is in effect. If a user enters a valid authorization code, the NCOS number associated with the authorization code is applied for the duration of the call.

While using the same telephone, it is possible to use three different NCOS numbers:

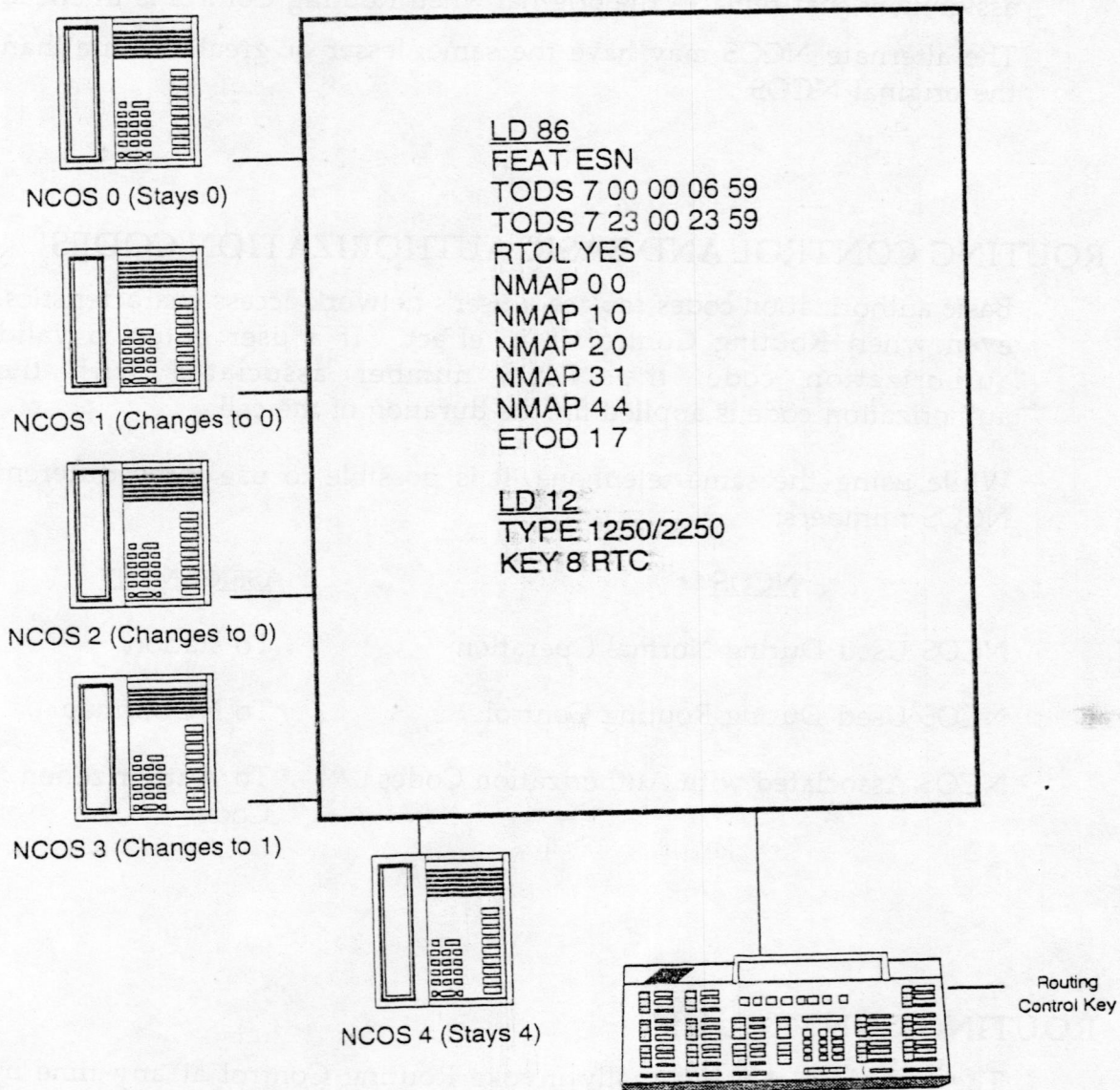
<u>NCOS</u>	<u>ASSIGNMENT</u>
NCOS Used During Normal Operation	To station
NCOS Used During Routing Control	To NCOS map
NCOS Associated with Authorization Codes	To Authorization Code

ROUTING CONTROL KEY

The attendant may manually invoke Routing Control at any time by using a Routing Control key. Routing Control is deactivated when the Routing Control key is pressed a second time. Routing control should only be used by trained attendants. This will avoid accidental use of Routing Control.

PROVISIONING ROUTING CONTROL

Owens Memorial Scenario Provisioned
Figure 2



320028
100190

SUMMARY

Routing Control is defined as a feature that provides a way to reduce or increase a user's network access capabilities by changing the assigned NCOS level. There are three ways RTCL can be invoked: A special TOD, Extended TOD or a key on the Attendant Console. The three ways were discussed in this lesson.

This lesson reviewed the parameters of TODS, and identified them for RTCL. An understanding of TODS is necessary to provision RTCL. You have already familiar with TODS up to this point. Additionally, you related RTCL to Basic Authorization Codes.

Finally, you identified the prompts and possible responses necessary to provision RTCL (with the help of your NTPs).

MODULE 14

OFF-HOOK QUEUING

INTRODUCTION

Off-Hook Queuing allows a station user who encounters all trunks busy in the ISET to remain off-hook while the system searches the ISET for an idle trunk. When an idle, eligible trunk is found, the call is completed. This module describes the purpose and parameters of Off-Hook Queuing (OHQ).

OBJECTIVE

Given the Student Guide and class notes, a student should be able to:

- Identify the correct definition of OHQ.
- List the OHQ eligibility tests.
- Identify the function, parameters and limitations of OHQ.
- Identify the OHQ availability test.
- Identify the OHQ offer and OHQ time limit.
- Explain what will occur when the OHQ time limit expires.

DEFINITION

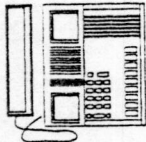
Off-Hook Queuing allows a station user who encounters all trunks busy in the ISET to remain off-hook while the system searches the ISET for an idle trunk. When an idle, eligible trunk is found, the call completes. If an idle, eligible trunk is not found within the Off-Hook Queue time limit (a customer-programmable time from two seconds to one minute), the system will search the ESET one time for an idle, eligible trunk. If an idle, eligible trunk is found, the call completes with no ERWT. If no idle, eligible trunk is found, the call is blocked.

⌋ WARNING TONE

The scenario on the following page shows how OHQ is determined for Bob Owen Hats, Inc.

OHQ Scenario Figure 1

Bob Owen Hats (Dallas)



DN 8103
NCOS 0 dials
5-1305-658-0398

AC1 = 5

Network Translation

NPA 1305 uses Route List 10.

Network Control

OHQ* is turned on for customer.
Time limit = 60 seconds.

NCOS 0 uses FRL 0.

OHQ* = allowed.

Routes:

Tie: OHQ* threshold = 5. Currently
7 priority 3 calls in queue
FEX: OHQ* threshold = 10. Currently
10 priority 3 calls in queue.
Band 3: OHQ* threshold = 15. Currently
18 priority 3 calls in queue.
Band 5: OHQ* threshold = 15. Currently
12 priority 3 calls in queue.
COT: OHQ* threshold = 6. Currently
4 priority 3 calls in queue.

Route List 10:

Entry 0	Entry 3
Route Tie	Route Band 5
FRL = 0	FRL = 1
Expensive = No	Expensive = No
OHQ* = Yes	OHQ* = Yes
Entry 1	Entry 4
Route FEX	Route COT
FRL = 0	FRL = 1
Expensive = No	Expensive = Yes
OHQ* = Yes	OHQ* = No
Entry 2	ISSET = 4
Route Band 3	(Entries 0, 1, 2, 3)
FRL = 0	
Expensive = No	
OHQ* = Yes	

OHQ* = Off-Hook Queuing

320138
043093

PARAMETERS

- Off-Hook Queuing package must be equipped.
- Call must pass the OHQ eligibility and availability tests.
- Maximum time in the OHQ is one minute.
- OHQ is allowed on the ISET only.
- OHQ tone is one burst of tone.
- All calls entering the OHQ will be assigned a priority of 3.

ELIGIBILITY

BARS calls may be placed in an OHQ if all trunk routes in the ISET are busy, and the following criteria are met:

- OHQ must be turned on for customer.
- The NCOS of the call originator allows OHQ.
- At least one entry in the ISET to which the user has access (via FRL, TOD and FCI) must allow OHQ.
- If the call is incoming on a TIE route, the route must allow OHQ.

AVAILABILITY

After a call has met all the OHQ eligibility tests, the system will check the OHQ availability test. If either the OHQ availability test or the OHQ eligibility test is not passed, the system may offer CBQ.

AVAILABILITY PURPOSE

The OHQ software performs an availability test to prevent calls from entering the OHQ when there is a high probability that the call will time-out before a trunk becomes available.

AVAILABILITY PARAMETERS

For each trunk route, a counter is maintained which reflects the current number of priority level 3 calls in queue. This includes all calls in the OHQ, Ring Again via direct trunk access, and those CBQ calls currently at priority 3.

Each trunk route has a threshold value that indicates the maximum number of priority 3 calls that may be queued against it before OHQ time-out becomes a high probability. Before a call is placed in the OHQ, the current queue count is compared with the threshold value for each eligible trunk route in the ISET. If at least one of the trunk routes has not met its threshold value, the call is allowed to OHQ against all OHQ-eligible routes.

OHQ OFFER

If all eligibility and availability checks are successful, the call originator is given OHQ offer tone (a one-second burst of tone) when the call enters the OHQ. The call originator either accepts the OHQ offer by remaining off-hook, or declines the offer by going on-hook.

OHQ TIME LIMIT

A customer-programmable time limit specifies the maximum amount of time a call may remain in the OHQ. When the time limit expires, the call will be removed from OHQ and the system will search the ESET one time for an idle, eligible trunk.

OHQ OPERATION

The OHQ feature operates as follows:

1. The station user places a call.
2. The switch checks the Initial Set and finds all eligible routes are busy.
3. The switch performs OHQ eligibility tests.
4. The switch performs OHQ availability tests.
5. A one-second burst of tone advises the user that the call is being placed in the OHQ.
6. The OHQ timer starts.
7. The call queues at level 3 against all eligible entries in the Initial Set that allows OHQ.
8. If a trunk in the Initial Set becomes idle before the timer expires, the switch seizes the trunk and completes the call.
9. If no trunk becomes idle before the timer expires, the call is removed from the OHQ. The Extended Set is searched once for an idle, eligible trunk.
10. If an idle, eligible trunk is found in the Extended Set, the call completes and no expensive route warning tone will be given to the user.
11. If an idle, eligible trunk is not found, the call is blocked via NBLK.

FEATURE INTERACTIONS

Call Modification

Station users are not allowed to activate call modification features (hold, conference, transfer) while waiting in the OHQ. The switchhook flash used to activate features from 500/2500 sets is ignored. Operation of Meridian 1 set feature keys are ignored.

Camp-On, Call Waiting

If the Meridian 1 attendant extends a trunk call to a station that is in the OHQ, the call-waiting or camp-on tone is not offered to the station. If the attendant releases, the call is camped-on, or the call is in call waiting at the OHQ station, but no warning tone is provided.

OFF HOOK QUEUING ELIGIBILITY TESTS

1. Is it turned on for the customer? (LD 87)

FEAT NCTL

SOHQ YES

OHTL 2 - (10) -60

2. Is it turned on for the call originator's NCOS? (LD 87)

FEAT NCTL

NCOS 0-99

OHQ YES

3. Does at least one entry in the ISET for which the call is eligible based on TOD, FCAS, and FRL allow OHQ? (LD 86)

FEAT RLB

ENTR 0-63

OHQ YES

ISET Must include above entry.

OFF HOOK QUEUING AVAILABILITY TEST

Is there at least one eligible route in the ISET whose OHQT has not been met by the current amount of priority 3 calls in queue?

TYPE RDB

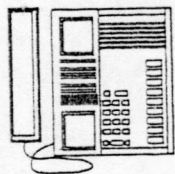
OHQT 0-63

The Off Hook Offer Is:

BEEP !!!

(One second burst of 440 hz)

Bob Owen Hats (Dallas)



DN 8103
NCOS 0 dials
5-1305-658-0398

<u>LD 86</u>	<u>LD 16</u>	ENTR 1
FEAT ESN	ROUT 6	ROUT 4
AC1 5	OHQT 5	FRL 0
		EXP NO
		OHQ YES
<u>LD 87</u>	ROUT 4	ENTR 2
FEAT NCTL	OHQT 10	ROUT 2
SOHQ YES		FRL 0
OHTL 60	ROUT 2	EXP NO
NCOS 0	OHQT 15	OHQ YES
FRL 0	ROUT 3	
OHQ YES	OHQT 6	ENTR 3
	ROUT 0	ROUT 3
<u>LD 90</u>	OHQT 6	FRL 1
FEAT NET	<u>LD 86</u>	EXP NO
TRAN AC1	FEAT RLB	OHQ YES
TYPE NPA	RLI 10	
NPA 1305		ENTR 4
RLI 10	ENTR 0	ROUT 0
	ROUT 6	FRL 1
	FRL 0	EXP YES
	EXP NO	OHQ NO
	OHQ YES	
		ISSET 4

- There are currently 7 priority 3 calls in queue on Route 6
- There are currently 8 priority 3 calls in queue on Route 4
- There are currently 18 priority 3 calls in queue on Route 2
- There are currently 12 priority 3 calls in queue on Route 3
- There are currently 4 priority 3 calls in queue on Route 0

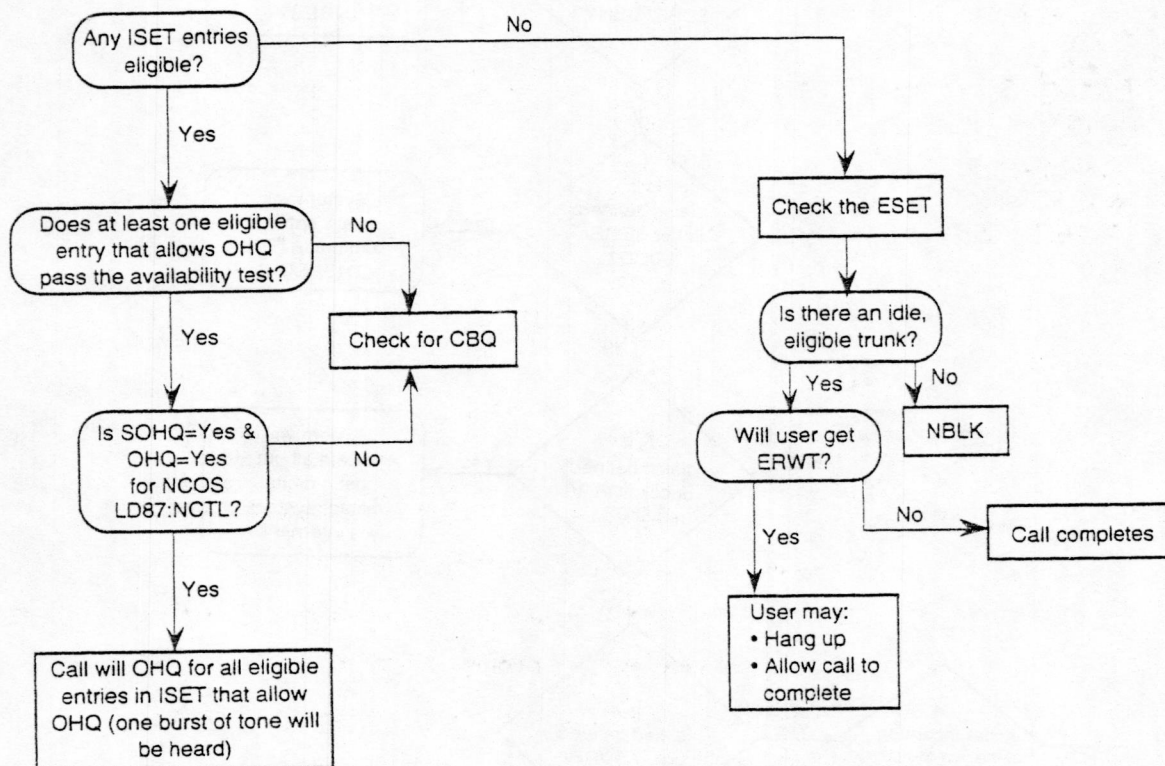
NOTE: TOD = All ON and FC1 = 0 for all RLI Entries.

OHQ* = Off-Hook Queuing

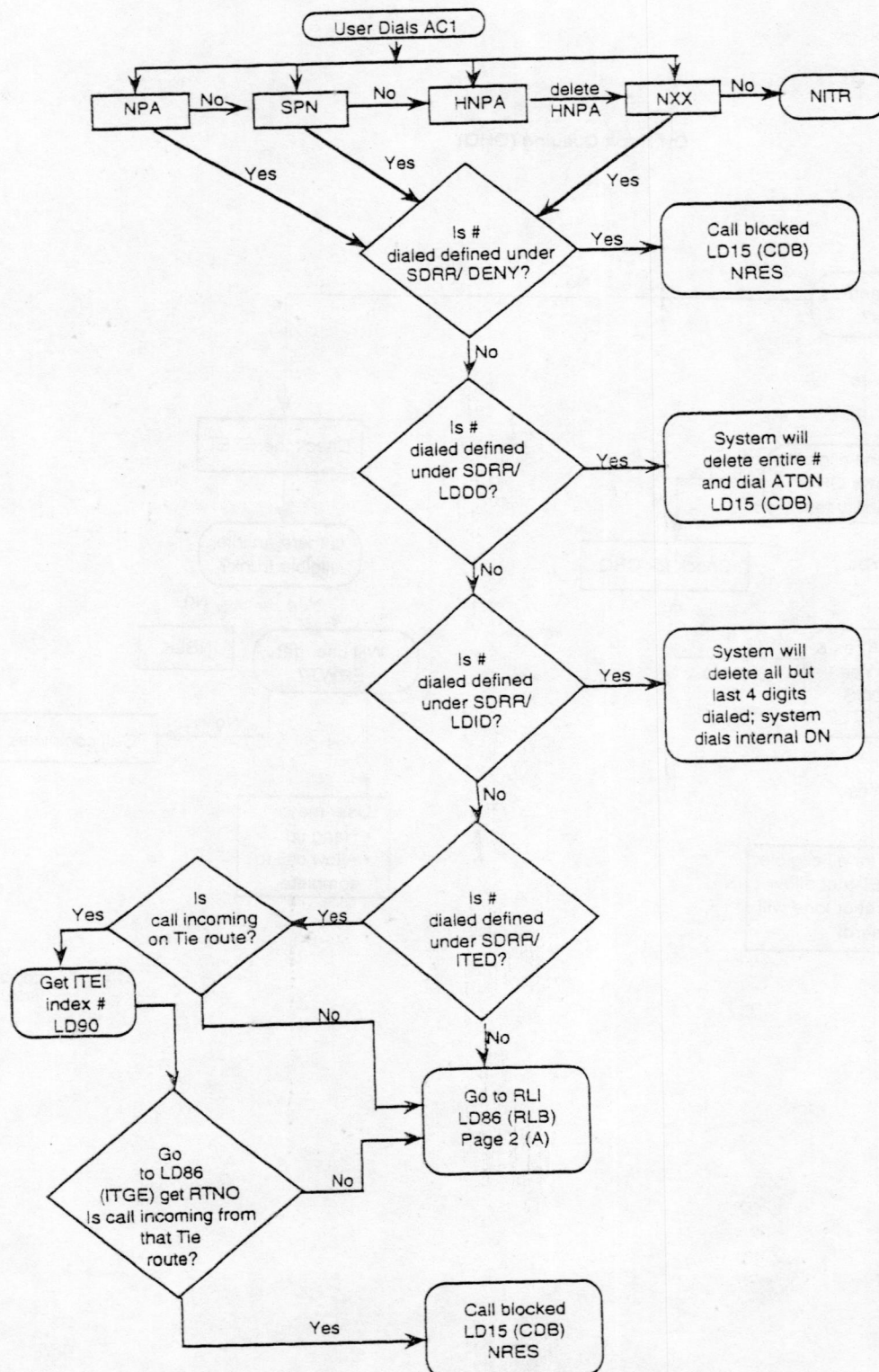
320031
100490

OHQ Flowchart
Figure 3

Off Hook Queuing (OHQ)

320062
101992

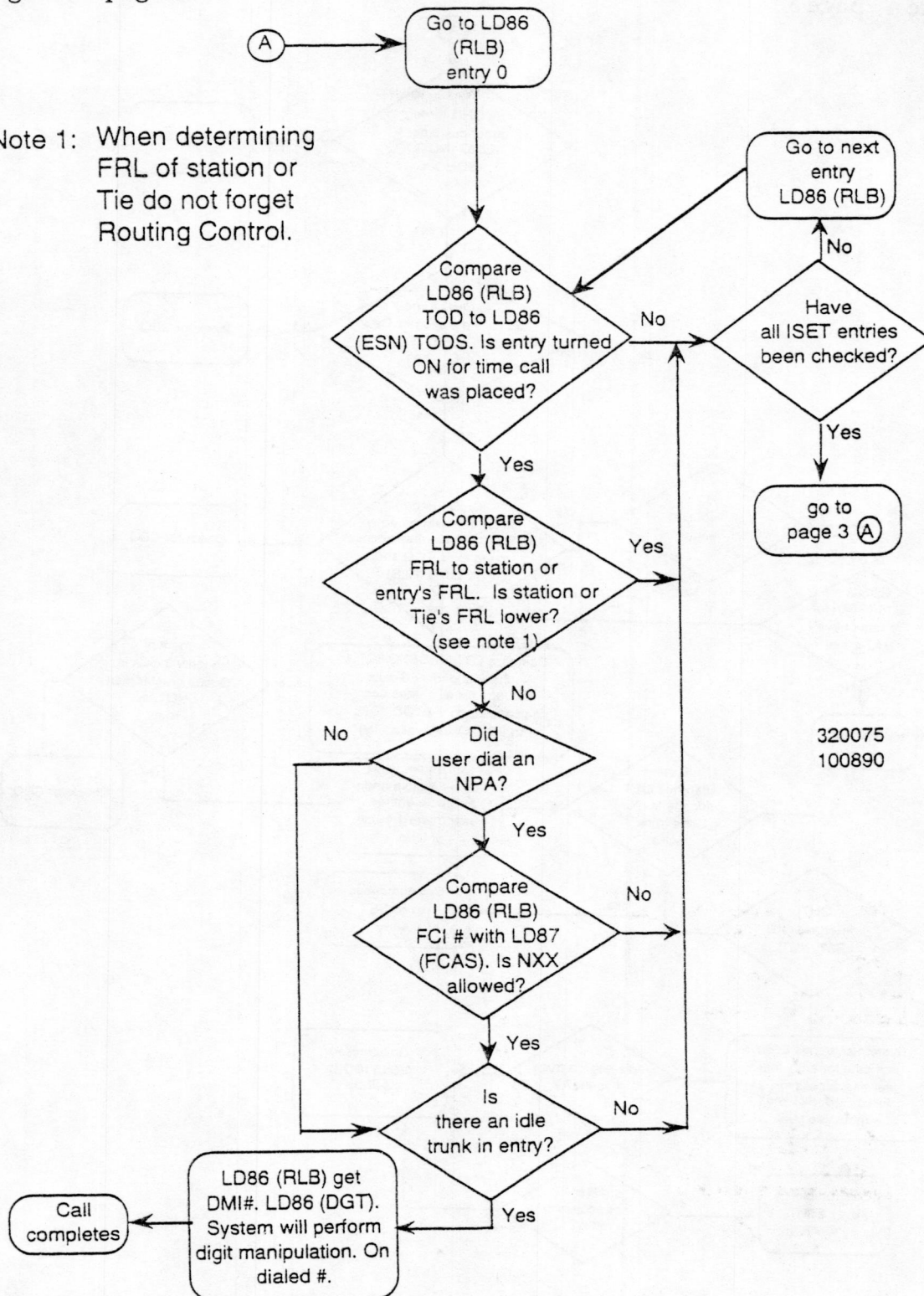
BARS Flowchart
Figure 4 page 1



320068
100890

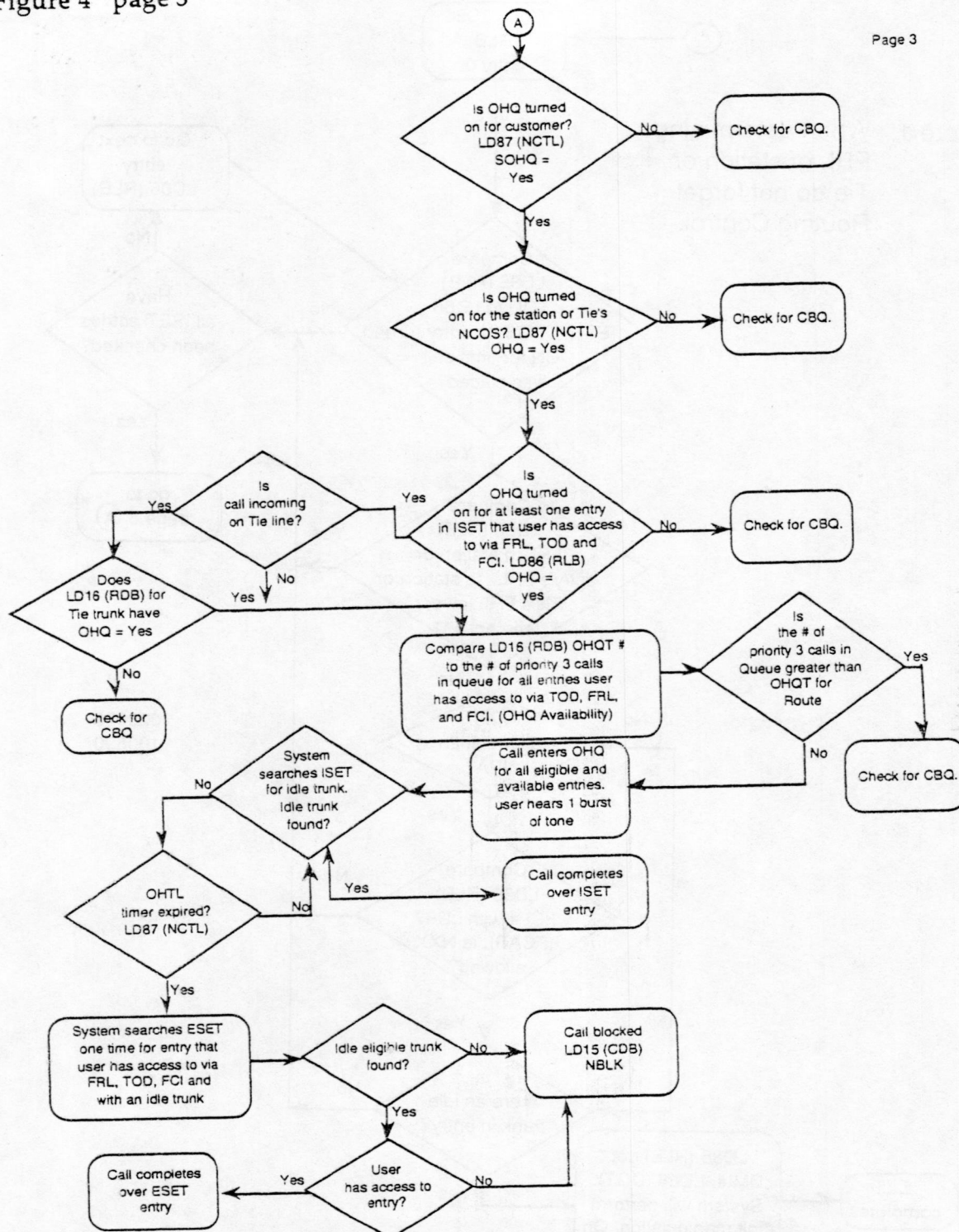
BARS Flowchart
Figure 4 page 2

Note 1: When determining FRL of station or Tie do not forget Routing Control.



BARS Flowchart
Figure 4 page 3

Page 3

320130
101992

SUMMARY

Off-Hook Queuing allows a station user encountering all trunks busy in the ISET to remain off hook while the system searches the ISET for an idle trunk. This lesson identified the function, parameters and limitations of this feature. The lesson also identified the eligibility and availability tests for OHQ. Their purpose and parameters were also discussed.

You learned how the OHQ feature operates, and the feature interactions of OHQ also. The OHQ eligibility, availability and thresholds were identified for a customer, and provisioned in class.

MODULE 15**CALL BACK QUEUING**

INTRODUCTION

Call Back Queuing (CBQ) provides a means for a station user who encounters all trunks busy in the ISET to activate Ring Again and go on-hook. The system will search ISET entries for an idle, eligible trunk. When an eligible trunk becomes available, the system will notify the user via Ring Again and place the outside call. This lesson describes the CBQ feature and its components.

OBJECTIVE

Given the Student Guide and class notes, the student should be able to:

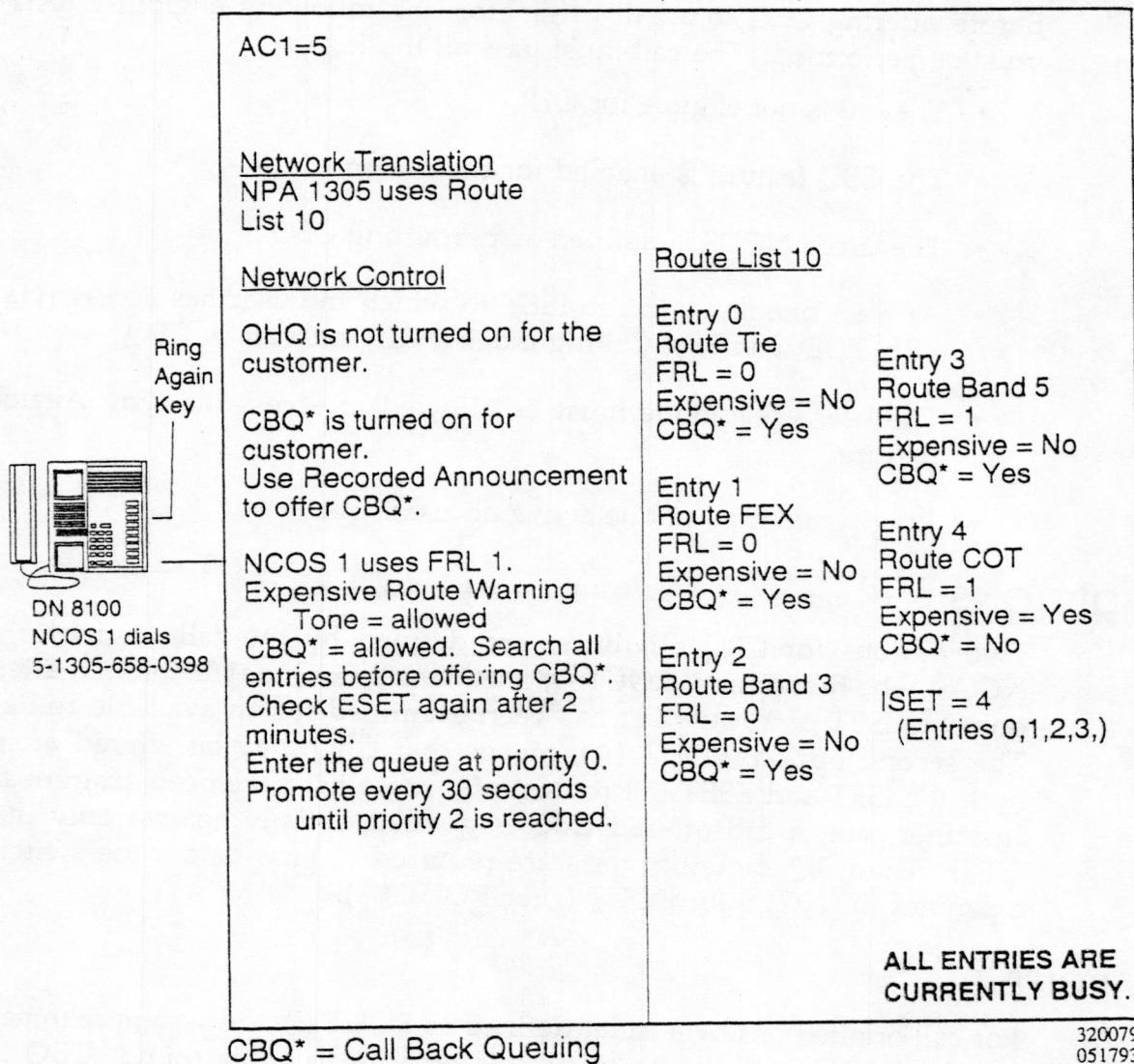
- Identify the correct definition of CBQ.
- Identify the parameters, purpose and limitations of CBQ.
- Identify the components of CBQ.
- Identify the function and purpose of the two CBQ options.
- List the CBQ eligibility tests.
- Define Priority Queuing and Route Advance Timer.
- Define the CBQ process.

DEFINITION

Call Back Queuing allows a station user who encounters all trunks busy in the ISET to activate Ring Again and go on-hook. The system will search the ISET for an idle, eligible trunk. When an eligible trunk becomes available, the system will notify the user via Ring Again. The user goes off-hook and depresses the Ring Again key. The call will complete.

CBQ Scenario
Figure 1

Bob Owen Hats Inc. (Dallas)



PARAMETERS

Switch must be equipped with the CBQ feature package.

ELIGIBILITY

Before offering CBQ to a call originator, the following eligibility tests must be performed. The call must pass all the tests.

- The call is not eligible for OHQ.
- The CBQ feature is enabled for the customer
- The user's NCOS is defined as permitting CBQ.
- At least one entry in the ISET to which the user has access [via FRL, TOD, and Free Calling Index (FCI)] must allow CBQ.
- The user's telephone must be allowed to access the Ring Again feature.
- Ring Again may not be active on user's set.

OPTIONS

Two options for CBQ eligibility are defined by the call originator's NCOS. The first option, ROUT (I), means that CBQ may be offered after only the ISET of a route list has been examined for an available route. The second option, ROUT (A), means that CBQ may be offered after both the ISET and ESET (all routes) of a route list have been examined. In either case, a call offered CBQ is queued initially against only the ISET. The CBQ eligibility tests are required to pass before the switch examines the NCOS for ROUT (I) or ROUT (A).

ROUT (I)

For call originations by a caller defined as ROUT (I), the system searches only the ISET for an idle trunk. If no idle trunk is found, CBQ is offered to the caller subject to the CBQ eligibility tests.

ROUT (A)

For call originations by a caller defined as ROUT (A), the system examines the ISET for an idle trunk. If no idle trunk is found, the ESET is then searched for an idle trunk. If an idle trunk is not found in the ESET, then CBQ is offered subject to the CBQ eligibility tests. However, if an idle trunk in the ESET is found and Expensive Route Warning Tone is not enabled, the call is completed, and the user will not be offered CBQ. If an idle trunk in the ESET is found and

Expensive Route Warning Tone is provided, the system delays in processing the call. This delay time is customer-programmable from two seconds to ten seconds. During the delay, the user has the following three options:

- Refuse the expensive route by abandoning the call.
- Wait, and allow the call to complete over the expensive route.
- Activate the Ring Again feature to place a call in the CBQ. The user must be ROUT (A) eligible; otherwise, operation of the Ring Again feature is ignored.

CBQ OFFER

There are two customer-programmable options for the CBQ offer: standard and optional. The standard CBQ offer is 30 seconds of overflow tone. The optional CBQ offer is a recorded announcement followed by 30 seconds of overflow tone. The recorded announcement keeps the station user from being confused about what to do. In either case, Ring Again may be activated at any time during overflow tone. The CBQ offer may be refused by going on-hook. If the station user neither accepts nor refuses the CBQ offer within 30 seconds, the call is forced to disconnect.

If a station is assigned a ROUT (A), NCOS and Expensive Route Warning Tone are enabled, then Expensive Route Warning Tone could be a CBQ offer also.

CBQ PRIORITY QUEUING

CBQ Priority Queuing is the process by which calls are queued against a trunk route by priority. Calls with a higher priority are queued ahead of calls with a lower priority level. Calls are assigned one of four priority levels numbered 0 through 3. The lowest priority is 0, and the highest priority is 3.

When a new call enters the queue, it does not necessarily enter at the end of the queue. Instead, the call enters the queue behind any calls with the same or higher priority level and ahead of any calls with a lower priority level.

COMPONENTS OF CBQ PRIORITY QUEUING

CBQ Priority Queuing initially places calls in order by priority. Calls may then advance in priority after remaining in queue a specified length of time.

Priority Queuing has three components:

- The Starting Priority (SPRI) specifies the priority level of the call when it is first placed in queue.
- The Maximum Priority (MPRI) specifies the highest priority level to which a call may advance.
- The Promotion Timer (30 seconds to 15 minutes) specifies the amount of time a call remains at one priority level before advancing to the next higher level.

PARAMETERS OF CBQ PRIORITY QUEUEING

The switch must be equipped with the priority Queuing Package (PQUE).

Starting Priority levels, Maximum Priority levels, and Promotion Times are assigned with an NCOS.

A promotion timer of 0 specifies that the call will never promote (or move to a higher level in the queue).

ROUTE ADVANCE TIMER

The Route Advance Timer (RADT) specifies the maximum amount of time a call remains in the CBQ against only the ISET. When the Route Advance Timer expires, the system also searches for an idle, eligible trunk in the ESET. If an idle, eligible trunk is found, the system will seize it and call the user back. If no idle, eligible trunk is found, the call will also queue on the ESET, assuming the user has access to the ESET and CBQ is enabled for ESET entries.

ROUTE ADVANCE TIMER AND EXPENSIVE ROUTE WARNING TONE

If the Route Advance Timer expires and the system finds an idle, eligible trunk in the ESET, the system will call the user back via Ring Again. The user will not receive Expensive Route Warning Tone even if it is enabled.

GUIDELINES FOR SETTING THE ROUTE ADVANCE TIMER

As soon as a call enters the CBQ, both the Route Advance Timer and the Promotion Timer begin to mark time. Each timer operates independently of the other. This may cause the Route Advance Timer to expire before a call has been promoted to its maximum priority. This gives the call less opportunity to seize an idle trunk in the ISET.

To give calls a better chance to seize a trunk in the ISET, the Route Advance Timer should always be set higher than a call's total promotion time.

PARAMETERS OF ROUTE ADVANCE TIMER

- Route Advance Timer (RADT) is associated with an NCOS.
- The Route Advance Timer may be set from 30 seconds to 15 minutes.
- A Route Advance Timer of 0 means the system will never advance the call to the ESET.

CBQ CALLBACK

When a trunk becomes available for a CBQ call, it is seized to prevent incoming originations during the CBQ callback period. Outpulsing of digits is started at a slow fixed rate. The number of digits outpulsed determines how long the trunk may be held while the CBQ callback is being offered. The system computes this time by allowing 10 seconds before the first digit is outpulsed and 2.56 seconds between subsequent digits.

The originator of the call is alerted to the CBQ callback by either tone buzzing and a winking Ring Again feature lamp (SL-1, Meridian digital sets), or short bursts of ringing (500/2500 sets). The Meridian 1 set user must accept the callback within the computed value of outpulse time or the customer-programmable CBQ time limit of 10 to 30 seconds, whichever is less. A user of a 500/2500 set must accept the callback within six seconds. If the user does not answer the callback within the time limit, the call is removed from the queue and discarded.

AUTOMATIC LEAST COST ROUTING AND CALL BACK QUEUING

A station user at a Meridian 1 places a call through BARS.

The BARS software translates the call and finds all trunks busy in the ISET.

The Meridian 1 system will check the six CBQ eligibility tests:

1. The system determines that this call is not eligible for OHQ.
2. CBQ turned on for the customer.
3. CBQ turned on for the NCOS of the set.
4. At least one eligible entry in the ISET allows CBQ.
5. Set is allowed access to Ring Again.
6. Ring Again is not active on the set.

If the call is not eligible for OHQ and then fails at least one eligibility tests 2-6, the system will search the ESET for an idle trunk to which the user has access (via FRL, FCI, and TOD). If found, the call completes without a CBQ offer. The user may hear Expensive Route Warning Tone.

If all six eligibility tests pass, the system will examine the NCOS of the set for ROUT (I) or ROUT (A).

ROUT (A)

If the call originator is ROUT (A), the system searches ESET for an idle, eligible trunk.

If an idle trunk is found then the system checks ERWT and, if allowed, the user will hear Expensive Route Warning Tone. Upon receiving ERWT the user may activate Ring Again and enter queue for the ISET entries only.

If user remains off-hook or Expensive Route Warning Tone is not allowed then the call will complete on the ESET entry.

ROUT (I)

If the call originator is ROUT (I) the system will offer CBQ without checking the ESET. The Meridian 1 system offers CBQ to the call originator (RAN and overflow tone or overflow tone only).

Call originator accepts CBQ by activating Ring Again.

The call enters the trunk queue at the Starting Priority defined by the set's NCOS, and both Route Advance and Promotion Timers start.

The call will promote one priority level each time the promotion timer is reached until the call reaches its maximum priority.

If an idle trunk is found in the ISET before the RADT expires, the system will initiate a callback.

When the RADT expires, the system searches the ESET for a trunk to which the user has access.

If an idle trunk is found (user must have access), the system will initiate a callback.

If all trunks are busy in the ESET and CBQ is turned on for an ESET entry, the call will also queue for the ESET entries.

The system will call the user back with the first idle trunk in the ESET or ISET.

CBQ CALLBACK

When the system finds an idle trunk, it will seize the idle trunk and start slow outpulsing.

System will notify the user via Ring Again.

A 500/2500 set will go off-hook to accept CBQ callback. A Meridian 1 set will go off-hook and activate the Ring Again key.

Call Completes

FEATURE INTERACTIONS

Hunting, Call Forward, Multiple Appearance DN

CBQ callbacks to stations are offered only to the originating station, regardless of the hunting or call forwarding which may be in effect. Other appearances of a station's Directory Number are not offered the callback.

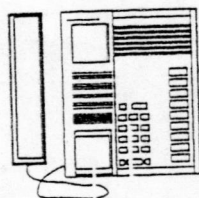
Attendant

Because the Meridian 1 Ring Again feature is not supported at the Meridian 1 attendant consoles, CBQ is not offered to an attendant regardless of the CBQ eligibility of the NCOS assigned to the attendant.

PROVISIONING CALL BACK QUEUING

CBQ Scenario Provisioned
Figure 2

Bob Owen Hats Inc. (Dallas)



DN 8100
NCOS 1 dials
5-1305-658-0398

Ring
Again
Key

<u>LD 86</u>	<u>LD 86</u>	
FEAT ESN	FEAT RLB	
AC1 5	RLI 10	ENTR 4
ERWT YES		ROUT 0
ERDT 6	ENTR 0	FRL 1
	ROUT 6	EXP YES
	FRL 0	CBQ YES
<u>LD 87</u>	EXP NO	
FEAT NCTL	CBQ YES	ISSET 4
SCBQ YES		
CBTL 18	ENTR 1	<u>LD 11</u>
RANE 16	ROUT 4	TYPE SL1
NCOS 1	FRL 0	NCOS 1
FRL 1	EXP NO	KEY 6 RGA
RWTA YES	CBQ YES	
CBQ YES		
ROUT A	ENTR 2	
RADT 4	ROUT 2	
SPRI 0	FRL 0	
MPRI 2	EXP NO	
PROM 1	CBQ YES	
<u>LD 90</u>	ENTR 3	
FEAT NET	ROUT 3	
TRAN AC1	FRL 1	
TYPE NPA	EXP NO	
NPA 1305	CBQ YES	
RLI 10		

ALL ENTRIES IN RLI 10
ARE CURRENTLY BUSY

NOTE: TOD = ALL ON and FCI = 0 for all RLI entries

CBQ* = Call Back Queuing

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CALL BACK QUEUING ELIGIBILITY TESTS

1. Has the call failed OHQ? (Either eligibility or availability)

2. Is it turned on for the customer? (LD 87)

FEAT NCTL

SCBQ YES

3. Is it turned on for the call originator's NCOS? (LD 87)

FEAT NCTL

NCOS 0-99

CBQ YES

4. Does at least one entry in the ISET for which the call is eligible based on TOD, FCAS, and FRL allow Call Back Queuing? (LD 86)

FEAT RLB

ENTR 0-63

CBQ YES

ISET Must include above entry

5 Does the user have Ring Again provisioned on their phone and is it idle? (LD 10)

TYPE 500

CLS XRA XFA

(LD 11)

TYPE Set type

KEY 0-69 RGA

The Call Back Queue Offer Is:

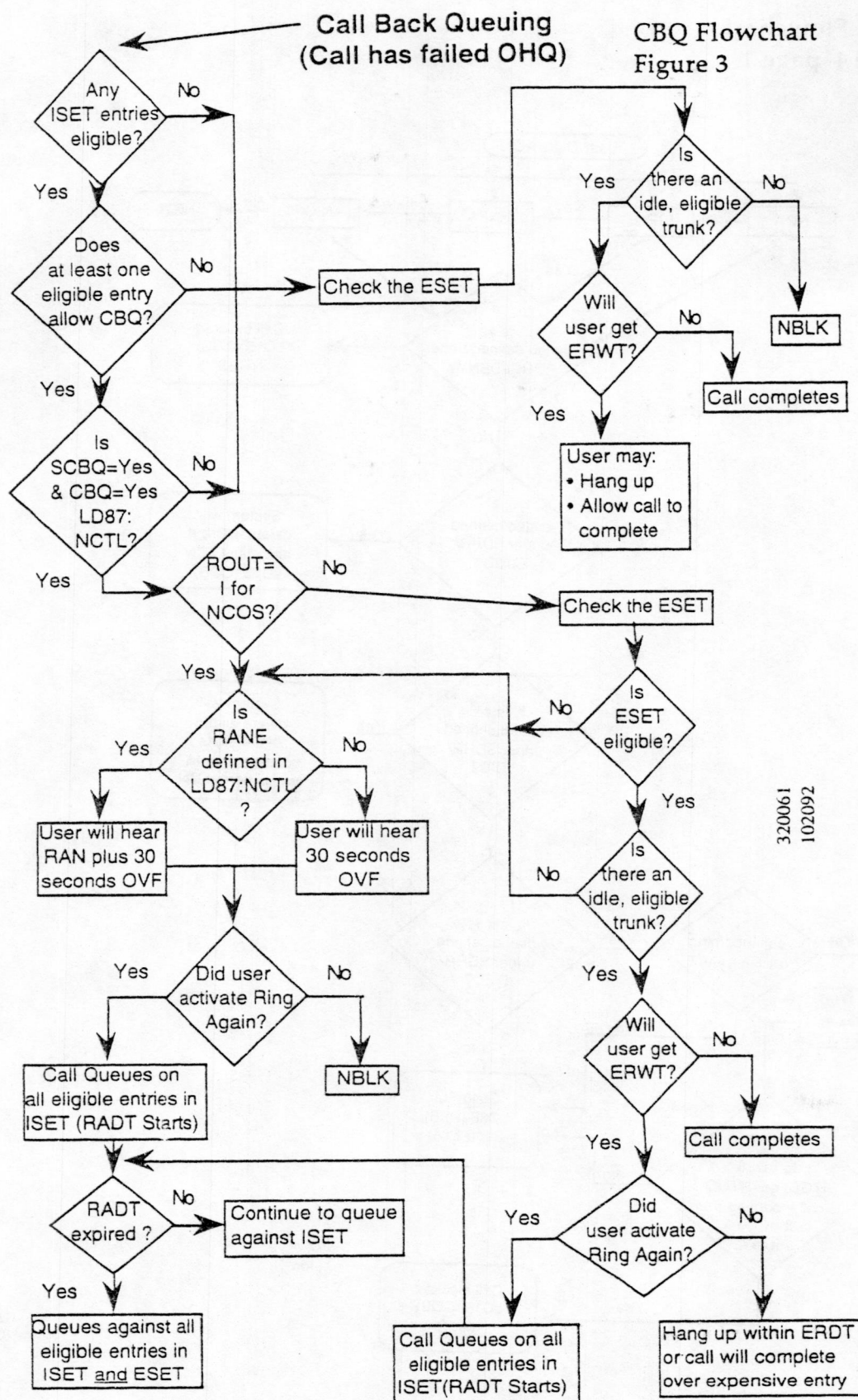
OVERFLOW TONE

(standard offer)

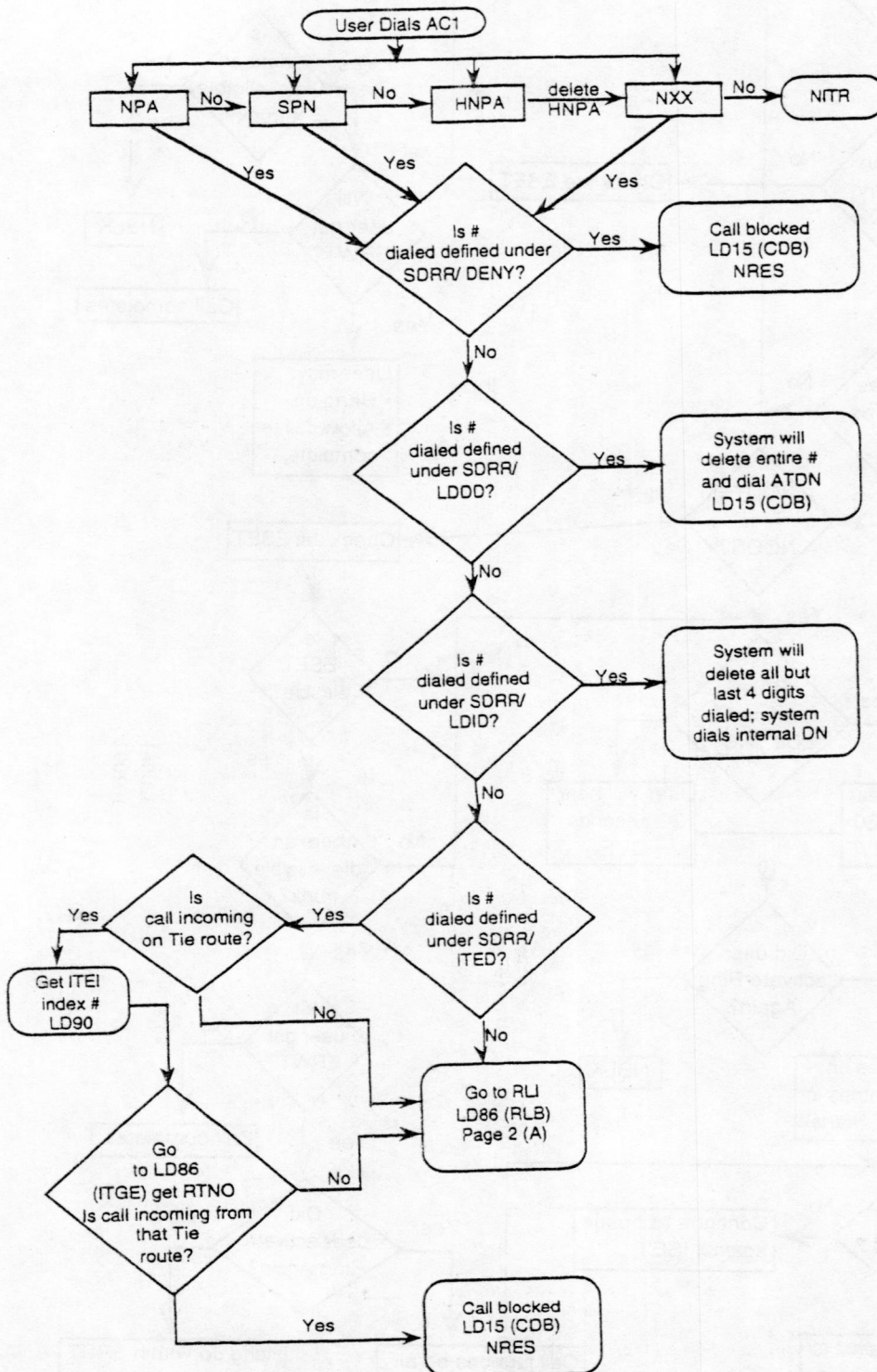
or

RECORDED ANNOUNCEMENT

(optional)



BARS Flowchart
Figure 4 page 1

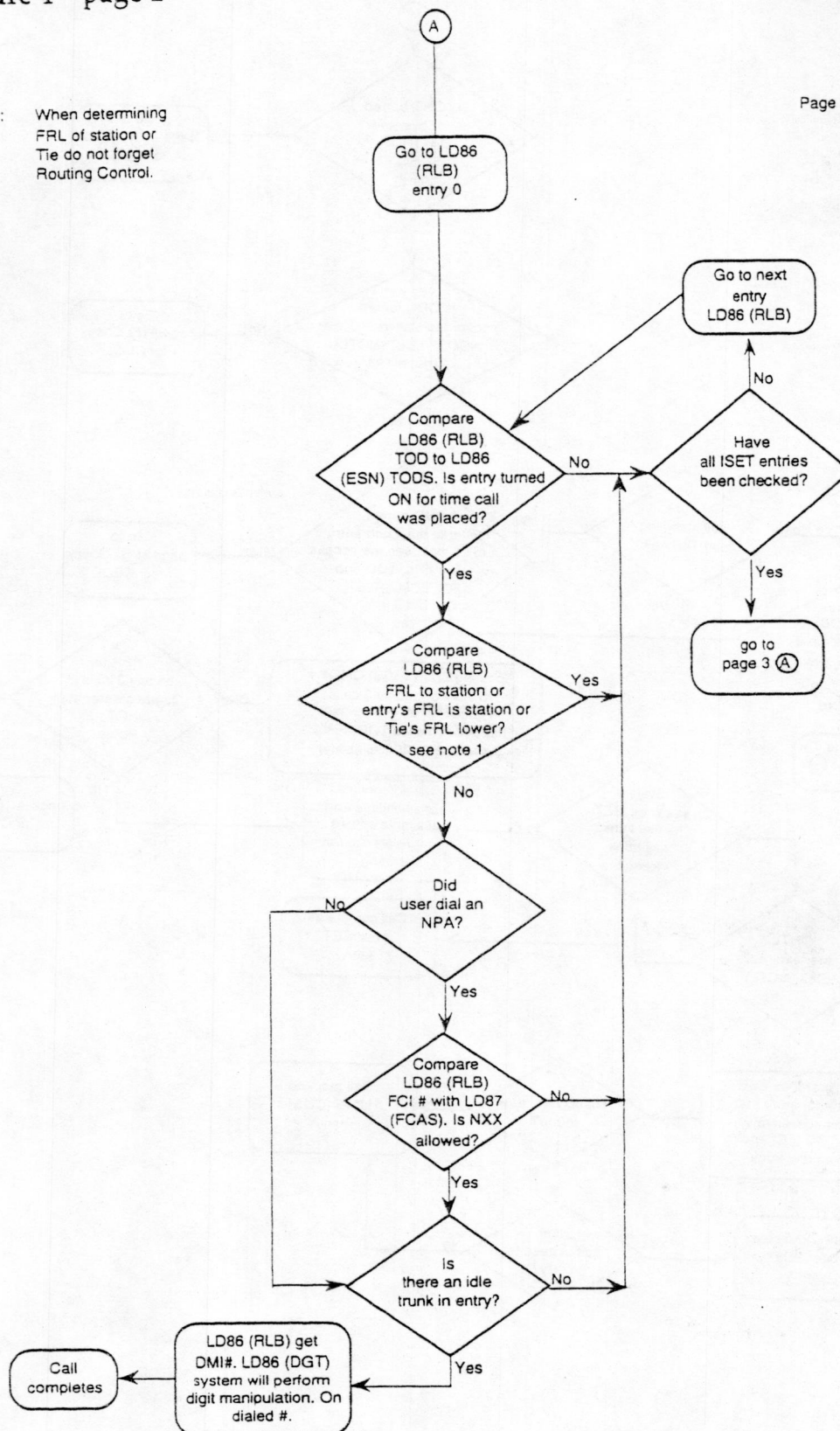


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BARS Flowchart
Figure 4 page 2

Note 1: When determining FRL of station or Tie do not forget Routing Control.

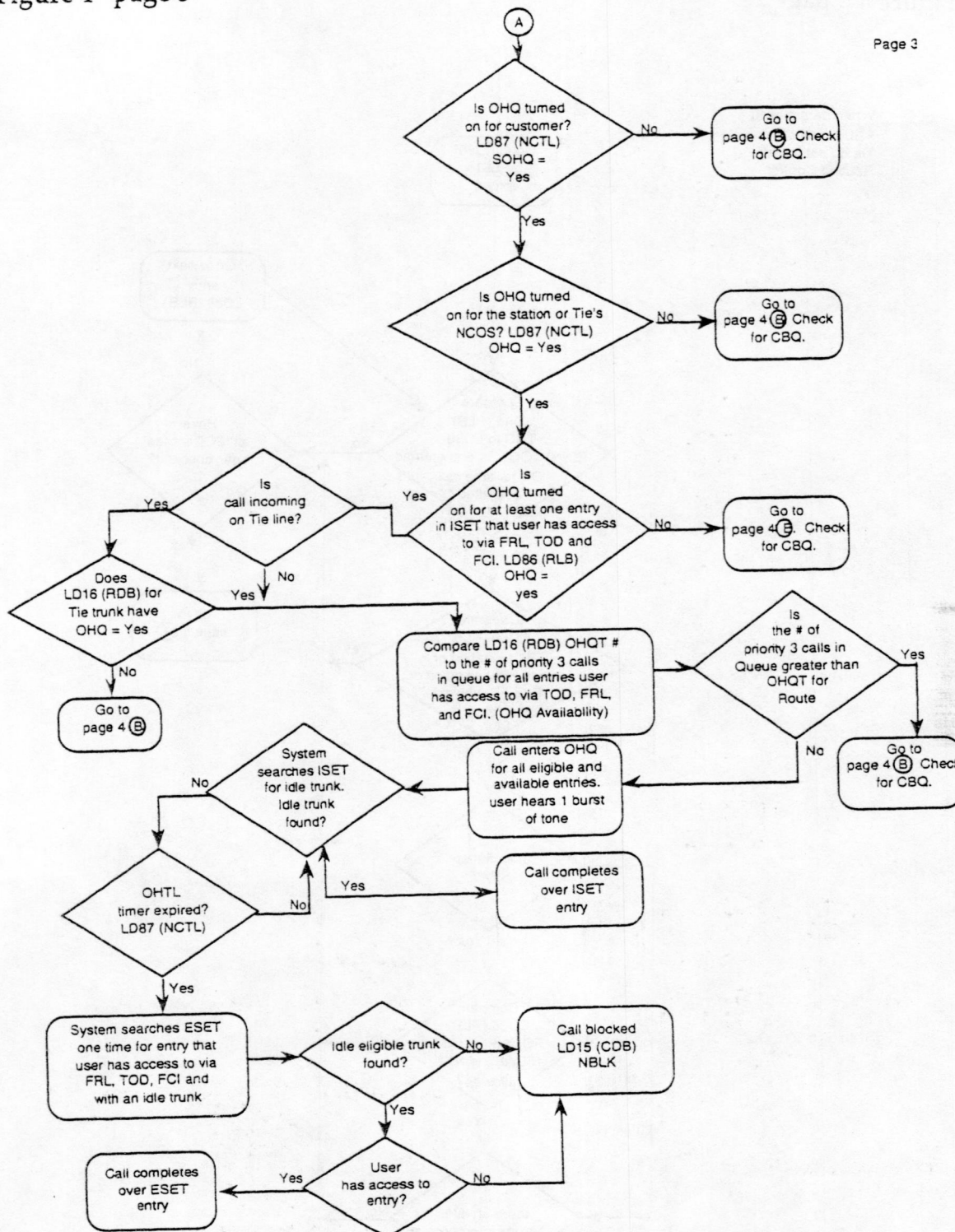
Page 2



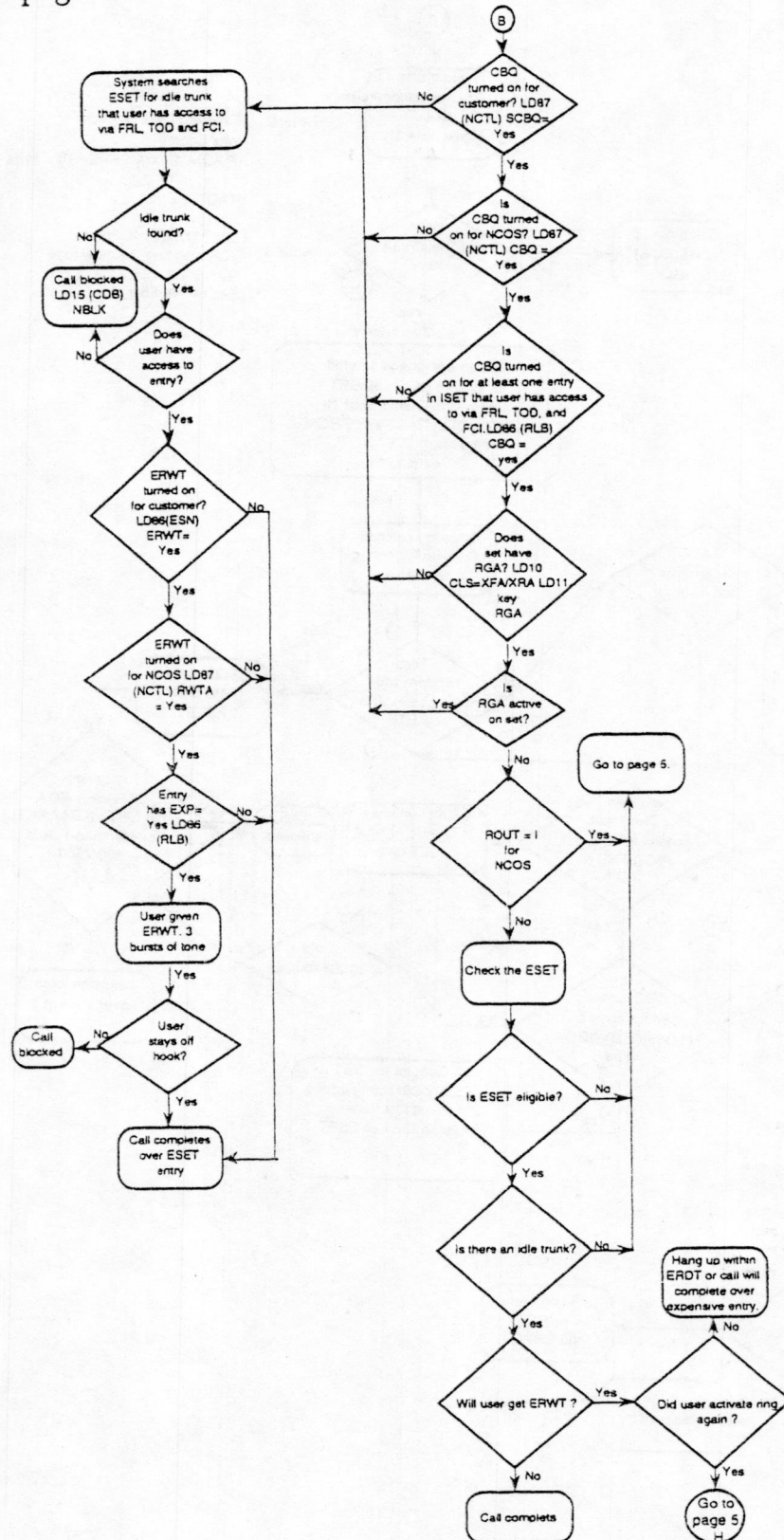
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BARS Flowchart
Figure 4 page 3

Page 3

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BARS Flowchart
Figure 4 page 4



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Page 5



SUMMARY

In this lesson, you learned that CBQ provides a way for a station user who encounters all trunks busy in the ISET to activate Ring Again and go on-hook. Also, the switch must be equipped with the CBQ feature package to provision this feature. There are certain eligibility tests that must be passed before offering CBQ, and these tests were outlined in this lesson. You discussed the options of CBQ, and they are ROUT (I) and ROUT (A). CBQ Offer has two customer-programmable options, and they are standard and optional. The offers were discussed in depth in this lesson. This lesson discussed CBQ Priority Queuing as the process whereby calls are queued against a trunk route by priority, and further elaborated on the components and parameters of CBQ Priority Queuing.

The Route Advance Timer specifies the maximum amount of time a call remains in the CBQ against only the ISET. RADT was also discussed as it directly relates to ERWT, and the guidelines and parameters for setting the RADT. CBQ Callback is an option available when a trunk becomes available for a CBQ call; the trunk is seized to prevent incoming originations during the CBQ callback period. CBQ was discussed as it relates to ALCR, as well as its feature interactions. Finally, you provisioned CBQ for a specific customer in this lesson.

MODULE 16

BASIC AUTHORIZATION CODES

INTRODUCTION

The Basic Authorization Code feature enables selected users to temporarily replace the access restrictions assigned to the station or incoming Tie trunk. This lesson describes the function and parameters of Basic Authorization Codes. The example on the following page explains how Owen Memorial Teaching Hospital has developed their Basic Authorization Code plan.

OBJECTIVE

Given the Student Guide and class notes, the student should be able to:

- Identify the correct definition of Basic Authorization Codes.
- Identify the correct definition of Station Specific Authorization Codes.
- Identify the purpose, parameters and limitations of Basic Authorization Codes.

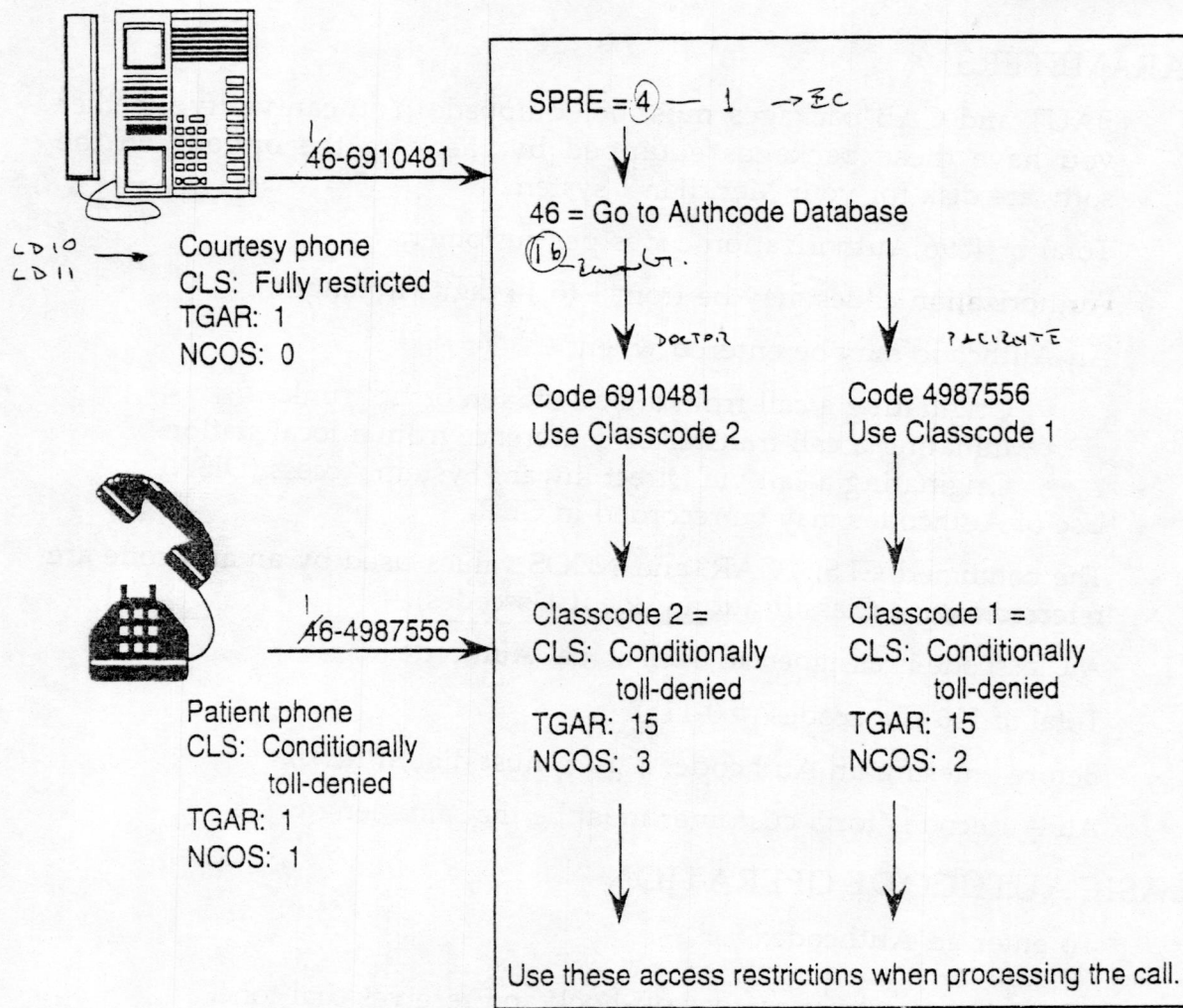
DEFINITION

The Meridian 1 Authorization Code feature enables users to temporarily override the access restrictions assigned to a station or tie trunk. A user may enter an Authorization Code (Authcode) to access different system facilities than would normally be allowed because of the assigned Network Class of Service (NCOS), Class of Service (CLS), and Trunk Group Access Restriction (TGAR).

The example on the following page explains how Owen Memorial Teaching Hospital has developed their Basic Authorization Code plan.

BAUT Scenario Figure 1

Owen Memorial Teaching Hospital wishes to provide each staff member with a portable set of network access characteristics so that they may place the same calls they may normally place from their own phones from any other phone at any time.



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PURPOSE

The feature is useful when a user initiates a call from someone else's telephone and requires access to more system facilities (e.g., access to long distance calling) than are allowed to that telephone. Entering a valid Authcode enables the user to access these additional facilities. Once a valid Authcode is entered, the NCOS, CLS and TGAR associated with the Authcode replace the NCOS, CLS, and TGAR associated with the telephone for the duration of the call.

PARAMETERS

BAUT and CAB packages must be equipped. You can verify whether you have these packages equipped by checking the options on the software disk for your Meridian 1 system.

Total of 4096 Authorization codes per customer.

Authorization codes may be from 1 to 14 digits in length.

An Authcode may be entered when:

- Originating a call from a local station or tie trunk.
- Initiating a call transfer or conference from a local station.
- Originating a call via Direct Inward System Access (DISA).

Use of Authcodes may be recorded in CDR.

The combined CLS, TGAR, and NCOS values used by an authcode are referred to as a Classification Code (Classcodes).

A Classcode is assigned to each actual Authcode.

Total of 116 Classcodes (# 0-115).

Before entering an Authcode, a user must dial SPRE+6.

All Authcodes for a customer must be the same length.

BASIC AUTHCODE OPERATION

To enter an Authcode:

1. The station user goes off-hook and receives dial tone.
2. The station user dials the SPRE code + 6 + the Authcode. If the Authcode entered is valid, a second dial tone is heard. If the Authcode is invalid, the call is force disconnected.
3. When the second dial tone is heard, the station user dials the telephone number as usual.

STATION SPECIFIC AUTHORIZATION CODES

With X11 Rls. 19 and later, Station Specific Authcodes, package 229, enables the system administrator to define the authorization code access level for each telephone. This feature applies to 500/2500, digital and multi-line phones, and is implemented on a per telephone basis.

Station Specific Authcodes provide three levels of Authcode access:

Authcode Unrestricted (AUTU) No authorization code limitations.

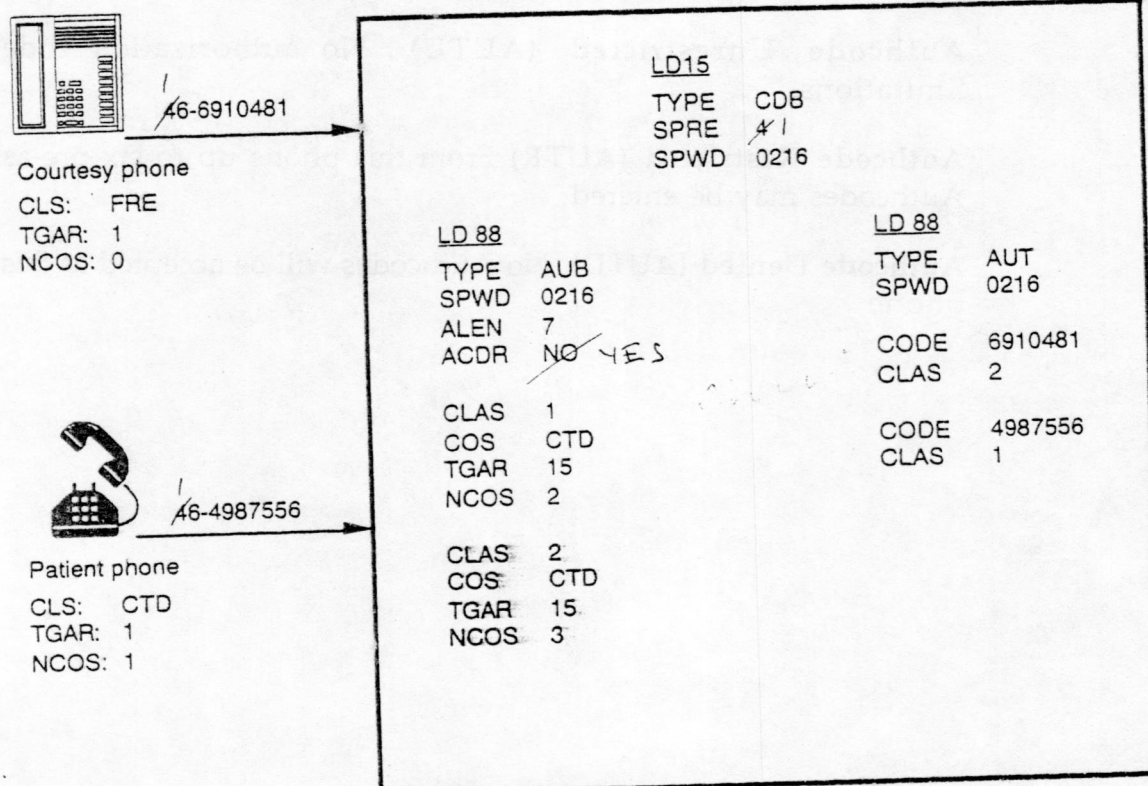
Authcode Restricted (AUTR) From this phone up to six pre-assigned Authcodes may be entered.

Authcode Denied (AUTD) No Authcodes will be accepted at this phone

PROVISIONING BASIC AUTHORIZATION CODES

BAUT Scenario Provisioned
Figure 2

Owen Memorial Teaching Hospital wishes to provide each staff member with a portable set of network access characteristics so that they may place the same calls they may normally place from their own phones from any other phone at any time.



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SUMMARY

Basic Authorization Codes enable users to temporarily override the access restrictions assigned to a station or trunk. The purpose, parameters and limitations of BAUT are valuable tools in determining the needs of an organization when preparing to provision a customer's database. This lesson also outlined how the BAUT worked for the customer. The prompts and possible responses needed to provision BAUT were described in detail.

MODULE 17

BARS INTERACTIONS WITH NON-BARS FEATURES

INTRODUCTION

This lesson describes how the various BARS features interact with non-BARS features.

Four non-BARS features interact directly with BARS software. These features are:

- Class of Service
- Trunk Group Access Restriction
- Intercept
- Digit Display

OBJECTIVE

Given the student Guide and class notes, the student should be able to:

- Identify how Class of Service works with BARS software.
- Identify how TGARs work with BARS software.
- Identify how Digit Display, CDR and Multi-Tenant Service works with BARS software.

ACCESS RESTRICTION

Each station, TIE trunk or authorization code in the system will be assigned three access restrictions:

- Class of Service
- Trunk Group Access Restriction (TGAR)
- Network Class of Service (NCOS)

CLASS OF SERVICE

Allows a customer to define a station user's degree of access to and from the exchange network.

Two parameters of Class of Service interact directly with BARS, CUN (conditionally toll unrestricted) and CTD (conditionally toll denied).

When a station user with an assigned Class of Service of CTD or CUN places a call through BARS, the system will use the station's NCOS to determine entry eligibility.

The remaining six categories of Class of Service remain unchanged when a station user places a call through BARS.

Class of Service Chart
Figure 1

CLS →

	UNR	CTD/ CUN	TLD	SRE	FRE	FR1	FR2
Incoming Trunk Calls	Yes	Yes	Yes	Yes	Via Call Modification ** *** No	No	No
Outgoing Non-Toll Trunk Calls	Yes	Yes	Yes	Yes Via Attendant or UNR Station*	Yes Via UNR Station*	No	No
Outgoing Toll Trunk Calls (0 or 1+ on COT or FEX)	Yes	Yes Via BARS/ NARS No Direct Access	Yes Via Attendant or Station No Direct Access	No Direct Access	No Direct Access	No	No
To/From Tie Trunk	Yes	Yes	Yes	Yes	Yes	Yes	No
To/From Internal	Yes	Yes	Yes	Yes	Yes	Yes	Yes
BARS/ NARS Calls TGAR = (No)	Uses NCOS Only	Uses NCOS Only	Uses NCOS and CLS	Uses NCOS and CLS	Uses NCOS and CLS	Uses NCOS and CLS	Uses NCOS and CLS
BARS/ NARS Calls TGAR = Yes	Uses NCOS and TGAR	Uses NCOS and TGAR	Uses NCOS, CLS and TGAR	Uses NCOS, CLS and TGAR	Uses NCOS, CLS and TGAR	Uses NCOS, CLS and TGAR	Uses CLS Only

* Via Call Modification: TRN, CONF, etc.

** Via TAFAS, Call Pickup, Call Modification if LD17 / FRPT=OLFR

*** If LD17 / FRPT=(NEFR)

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TRUNK GROUP ACCESS RESTRICTION (TGAR)

TGAR allows a customer to allow or deny a station's direct access to specific trunk routes.

When placing a call through BARS, TGARs can be examined or ignored.

The customer may decide to have BARS ignore TGARs when determining a user's entry eligibility. In this case TGARs and TARGs are used to deny stations direct access to trunk routes, thus forcing the station user to place calls through BARS.

The customer may decide to have BARS use TGARs when determining a user's entry eligibility. In this case before a user can gain access to a route list entry, the user's TGAR and NCOS must allow access and CLS must allow call type.

ACCESS RESTRICTION EXAMPLE 1

A station user is assigned a Class of Service of CTD, a TGAR that denies direct access to all routes, and a NCOS of 3.

- BARS is programmed to ignore TGARs.
- NCOS of 3 has a FRL of 3.
- Station user dials AC1+1+216+398+1236.
- Calls to the NPA 1216 goes to route list index seven.

Route list index seven

Entry zero
Route Band five
Facility Restriction level two

Entry one
Route COT
Facility Restriction level four

ISSET one

The user's Class of Service allows call type on all routes (allowed entry zero and one).

The user's TGARs will be ignored by BARS.

The Facility Restriction level of the user's NCOS allows access to entry zero only.

For this user, the call can complete over entry zero only.

ACCESS RESTRICTION EXAMPLE 2

A station user is assigned a Class of Service of TLD, a TGAR that denies access to the WATS route, and a NCOS of 3.

- BARS is programmed to examine TGARs.
- The NCOS of 3 has a FRL of 3.
- Station user dials AC1+1+216+398+1236.
- Calls to the NPA 1216 goes to route list index seven.

Route list index seven

Entry zero
Route FEX
Facility Restriction level zero

Entry one
Route WATS
Facility Restriction level two

Entry two
Route COT
Facility Restriction level five

ISSET two

The user's Class of Service denies the call type on COT and FEX routes only.

The user does not have access to entry zero, because the Class of Service TLD does not allow 0 or 1+ dialing on a COT or FEX route.

The user does not have access to entry one, because the BARS software is programmed to use TGARs. The user's TGAR does not allow access to the WATS route.

The user does not have access to the entry two for two reasons:

- The user's Class of Service does not allow the call type on a COT route.
- The user's NCOS does not allow access to the entry.

INTERCEPT

Calls that cannot be completed because of call restrictions or dialing irregularities can be routed to overflow tone, recorded announcement, or the attendant. Separate treatments can be specified for calls from four categories of originating party:

- Station or DISA calls
- Attendant extended calls
- TIE trunk calls
- DID trunk calls

Four intercept situations are reserved for BARS calls. They are:

- BARS Invalid (NINV)
- BARS Invalid Translation (NITR)
- BARS Restricted (NRES)
- BARS Blocked (NBLK)

Network Intercept Treatment Chart
Figure 2

Network Intercept Treatment

	Station or DISA	Attendant-Extended or Originated	Tie Trunk	DID	
NINV	(OVF) ATN RAN	(OVF) ATN RAN	(OVF) ATN RAN	OVF (ATN) RAN	No translation table No Network Control data block
NITR	(OVF) ATN RAN	(OVF) ATN RAN	(OVF) ATN RAN	OVF (ATN) RAN	Digit sequence dialed is not in translation table
NRES	(OVF) ATN RAN	(OVF) ATN RAN	(OVF) ATN RAN	OVF (ATN) RAN	Initial digit sequence located in translation table, but subsequent digit sequence blocked via SDRR
NBLK	(OVF) ATN RAN	(OVF) ATN RAN	(OVF) ATN RAN	OVF (ATN) RAN	Call blocked via: • All trunks busy • TOD • FCI • FRL

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DIGIT DISPLAY

When a Meridian 1 phone or attendant console is equipped with a Digit Display, digits dialed by a station user are displayed exactly as they are dialed.

The BARS feature of Digit Manipulation does not alter the way the digits are viewed in the digit display.

The station user sees the number just as he/she dials them, not as they are outpulsed.

Warning Tone Chart
Figure 3

Tone Chart

Expensive Route Warning Tone	Off-Hook Queue	Call Back Queue (I) LD 87 Rout = I	Call Back Queue (A) LD 87 Rout = A
3 256ms bursts of 440Hz	1 sec burst of 440 Hz	<u>CBQ (I)</u> <u>Overflow tone</u> <u>OR</u> <u>Optional RAN</u> <u>+ overflow tone</u>	<u>CBQ (A)</u> <u>ESET busy OR not</u> <u>allowed</u>
			<u>overflow tone</u> <u>OR</u> <u>Optional RAN</u> <u>+ overflow</u> <u>tone</u>
			<u>ESET idle RWTA</u> <u>=Yes</u>
			<u>3 bursts of tone</u> <u>ESET idle RWTA</u> <u>=No</u>
			<u>NONE</u>

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SUMMARY

In this lesson, you learned how the BARS software interacted with Class of Service, Trunk Group Access Restrictions, Intercept, Digit Display. You were also able to determine that these features rely on each other to operate efficiently, and it is important for you to provision each of the BARS software features accurately.

DEFINITION

Call Tracing is a program that provides a way of tracing a call by looking at a snap shot of the transient data (such as call registers) associated with the call. Call Tracing can be loaded by a TTY or the maintenance Meridian 1 telephone.

PURPOSE OF CALL TRACE

When a customer has consistent problems with one or more apparently legitimate calls not completing, each call should be traced to determine where, when, and whether the call is blocking in BARS. The one thing which cannot be determined from a call trace is which trunks were busy when the call was placed.

Example 1

If both OHQ and CBQ are denied, and all trunks in a Route List are busy, the call blocks.

Example 2

If the network attempts to offer CBQ and the station user's set doesn't have Ring Again programmed, the call blocks.

Example 3

For a given call, if the FRL of the NCOS is too low to be eligible for any Route List entry in a Route List, the call blocks.

Example 4

If the NPA dialed by a station user is not found in the appropriate Translation Table, the call blocks.

USING CALL TRACE

There are three basic commands that you must know to perform call trace in overlay program 80 Call Trace Program (TRA):

- TRAT is used for tracing attendant console problems
- TRAC is used for tracing 500/2500 and multi-line sets and trunks

- TRAD is used for tracing calls through Computer PBX Interface (CPI), Digital Trunk Interface (DTI), Primary Rate Interface (PRI) or Digital Link Interface (DLI) loops.

Please refer to LD80 in your Input/Output Guide for additional information on provisioning call trace.

PRINT ROUTINES AND BARS

Information implemented using overlay programs 10, 11, 12, 14 and 18 is printed using the print routine in overlay program 20. Information implemented using overlay programs 15 and 16 is printed using the print routine in overlay program 21.

Overlay 20 is used to print:

- NCOS, TGAR, and CLS assigned to 500/2500 sets (from Overlay 10).
- NCOS, TGAR and CLS assigned to multi-line sets (from Overlay 11).
- RTC key assigned to attendant console (from Overlay 12).
- NCOS, TGAR, and CLS assigned to tie trunks (from Overlay 14).

Overlay 21 is used to print:

- NCOS assigned to attendant console (from Overlay 15).
- Intercept treatment for BARS calls (from Overlay 15).
- OHQ threshold defined for each trunk route (from Overlay 16).

Information on equipped packages, as well as the version and issue of the tape or disk, is printed using overlay program 22.

PRINTING OVERLAYS

Overlay programs 24, 86, 87, 88, 90, and 93 may be used to enter new information. You may also use the same overlays to print the existing data.

Overlay Program 24

TGAR, NCOS, and COS assigned to the DISA DN.

Overlay Program 86

ESN data block.

Digit Manipulation Tables.

Route List indexes.

Incoming Trunk Group Exclusion indexes.

Overlay Program 87

Network Control data block.

Free Calling Area Screening Tables.

Overlay Program 88

AUB data block

AUT data block

Overlay Program 90

Network Translation

Overlay Program 93

Tenant to route access

BEFORE YOU TRACE A CALL

Before you begin to trace a call, you must find out three things:

- The number dialed
- The DN of the originating station.
- When the call was placed.

These three pieces of information are used to help trace the call effectively.

Additionally, it is helpful to check the console to determine whether:

- The RTC key was activated.
- Any trunk group busy keys were activated.
- The network time was accurate when the call was placed.

HOW TO TRACE A CALL

The most thorough way to trace a call is:

- Print all the information required.
- Examine the printed information in the same order that a call is processed through BARS.
- Look for data base installation oversights that may cause blocking of a call that should otherwise complete.

INFORMATION NEEDED TO TRACE A CALL**AUT (88)**

- If an authcode was entered, check its validity.
- Note the Classcode associated with Authcode.

AUB (88)

- Find Classcode associated with the Authcode and note the new NCOS, TGAR, and Class of Service that apply to the call.

ESN (86)

- Check the access code to confirm that the call is accessing BARS.
- Check to see if dial tone is provided after the access code.
- Check to see if ERWT is enabled for this customer.
- Find and note the TOD schedule that coincides with the time of the call.
- Check to see if Routing Control is in effect and, if so, note the original and alternate NCOS mapping
- Check to see if TGAR is being observed or ignored in BARS.

TNB (20)

- Find the NCOS assigned to the originating station.
- Find the Class of Service of the originating station.
- Find the TGAR (if applicable) of the originating station.

DISA (24)

- Find the NCOS, TGAR, and Class of Service of the DISA DN.

NET (90)

- Find the NPA/NXX/SPN dialed.
- Identify the appropriate Route List index number.

- Check to see if Supplemental Digit Restriction/Recognition is in effect.

NCTL (87)

- Find the Network Access Characteristics of the NCOS that applies to the call (RWTA, FRL, OHQ and CBQ).

RLB (86)

- Find the appropriate Route List.
- Analyze eligibility for each Route List entry (TOD, FRL, FCI, TGAR (if applicable) tenant to route access, Class of Service).

FCAS (87)

- Find the FCAS table referenced on each Route List entry in the Route List.

DGT (86)

- Find the Digit Manipulation table referenced on each Route List entry in the Route List.

CALL PROCESSING

Note: Unless otherwise specified, each step refers to what the Meridian 1 does. (Figure 1).

DN Translator

1. Checks to see if SPRE+6+Authcode is dialed.
 - If yes, proceeds to AUB data block.
 - If no, checks to see if number dialed is BARS access code (AC1).
 - If yes, proceeds to ESN data block (Step 7).
 - If no, call cannot access BARS.

AUB Data Block

2. Checks to see if length of Authcode entered is equal to ALEN.
 - If no, then, following interdigit time-out, line lockout treatment is provided.

- If yes, proceeds to AUT data block.

AUT Data Block

3. Checks to see if Authcode entered is valid.
 - If no, the caller hears silence followed by overflow tone.
 - If yes, identifies Classcode number and proceeds to AUB data block.

AUB Data Block

4. Locates Classcode referenced in AUT data block.
5. Identifies Class of Service, TGAR, and NCOS of Authcode dialed and "remembers" them. Dial tone is provided.
6. Station user dials AC1 and network proceeds to DN Translator (Step 1).

ESN Data Block

7. Checks DLTN to see if dial tone is to be provided.
8. Station user completes dialing call.
9. Checks network time and date.
10. Compares time with TOD Schedules.
11. Identifies TOD Schedule number that applies.
12. "Remembers" TOD Schedule number.
13. Checks to see if Routing Control is in effect.
 - If no, accesses appropriate Translation Table (Step 17).
 - If yes, checks Station data block.

Station Data Block

14. Identifies original NCOS of station.

ESN Data Block

15. Identifies alternate NCOS to replace original NCOS.

16. "Remembers" alternate NCOS.
17. Accesses appropriate Translation Table.

Translation Table Data Block

18. Locates digits dialed after access code.
 - If not found, call is sent to intercept as invalid BARS translation (NITR).
 - If found, identifies Route List Index number.
19. "Remembers" RLI.
20. Checks to see if Supplemental Digit Restriction or Recognition applies.
 - If part or all of remaining digits dialed are denied, call is sent to intercept as a BARS restricted call (NRES).
 - If SDRR does not apply, call continues to Route List data block.

Route List Data Block

21. Finds appropriate Route List.
22. Determines which entries are in the ISET.
23. Checks to see if entry 0 is idle.
 - If no, proceeds to entry 1.
 - If yes, begins checking entry 0 eligibility.
24. Checks to see if TOD Schedule allows access.
 - a. If no, proceeds to entry 1.
 - b. If yes, proceeds to Network Control data block.

Network Control Data Block

25. Identifies FRL of NCOS.

26. "Remembers" FRL.

Route List Data Block

27. Compares Route List entry's FRL with NCOS' FRL.

- If Route List entry is higher than NCOS' FRL, proceeds to entry 1.
- If FRL of Route List entry is equal to or less than NCOS' FRL, it continues checking eligibility.

28. Proceeds to FCI and checks for FCI other than 0.

- If FCI is 0, proceeds to DMI.
- If FCI is other than 0, proceeds to appropriate FCAS table.

FCAS Data Block

29. Looks to see if NPA dialed is in FCAS table.

- If no, returns to Route List entry 0 to process call.
- If yes, checks to see if NXX dialed is allowed or denied.
 - If denied, proceeds to Route List entry 1.
 - If allowed, returns to Route List entry 0.

Route List Data Block

30. Checks DMI for number other than 0.

- If DMI 0, proceeds to Step 33.
- If DMI other than 0, proceeds to appropriate Digit Manipulation Table.

Digit Manipulation Table Data Block

31. Performs appropriate deletions and insertions.

32. Returns to Route List.

Route List Data Block

33. Determines whether to provide Expensive Route Warning Tone (only if entry is in Extended Set).
34. Checks route and proceeds to Route data block.

Route Data Block

35. Identifies trunk route type.
36. Proceeds to Station data block.

Station Data Block

37. Identifies Class of Service of this station.
 - If COS deny call, proceeds to Route List entry 1.
 - If COS allows call, returns to Route data block.

Route Data Block

38. Identifies trunk route access code at ACOD.
39. Output pulses trunk route access code thereby seizing trunk.
40. Output pulses digits of call and call completes.
41. If entry 0 is not idle, checks everything as shown from step 23, only on Route List entry 1.

Route List Data Block

(If all of ISET is busy.)

42. Determines which entries are eligible by checking TOD, FRL, FCI, and COS of station.
43. Goes to Network Control Data Block.

Network Control Data Block

44. Checks to see if OHQ is enabled for this customer.
 - If no, tests CBQ eligibility (Step 50).
 - If yes, continues to next step.
45. Checks NCOS to see if OHQ is allowed.
 - If no, tests CBQ eligibility (Step 50).
 - If yes, proceeds to Route List.

Route List Data Block

46. Checks to see if at least 1 eligible entry in ISET allow OHQ.
 - If no, tests CBQ eligibility (Step 50).
 - If yes, checks OHQ availability.

Route Data Block

47. Compares to OHQ threshold the number of Priority Level 3 calls in queue for eligible Route List entries in ISET that allow OHQ.
 - If at least one Route List entry has threshold greater than or equal to count, call is placed in OHQ on all eligible Route List entries allowing OHQ.
 - If none, call tests CBQ eligibility (Step 50).

Network Control Data Block

48. If OHQ eligibility and availability pass, call is placed in OHQ for time specified in OHTL.
 - If no Route List entry becomes idle before OHTL expires, proceeds to Route List.

Note: CBQ is never offered to call after it is placed in OHQ.

Route List Data Block

49. Searches Extended Set for idle, eligible trunk.
 - a. If found, call completes (Step 38).
 - b. If not found, sends call to intercept as BARS blocked call (NBLK).

Network Control Data Block

50. Checks to see if CBQ is enabled for this customer.
51. If not enabled, proceeds to Extended Set and searches for idle, eligible trunk.
 - If not found, sent to intercept as a BARS blocked call (NBLK).
 - If found, checks DMI (Step 30), EXP (Step 33) and call completes (Step 38).
52. If CBQ is enabled, checks NCOS to see if CBQ is allowed.
 - If not, call proceeds to Extended Set (Step 51).
 - If yes, proceeds to Route List.

Route List Data Block

53. Checks to see if at least one eligible entry in ISET allows CBQ.
 - If no, call proceeds to Extended Set (Step 51).
 - If yes, it passes CBQ eligibility and continues.

Network Control Data Block

54. Checks to see if NCOS is CBQ (I) or CBQ (A).
 - a. If CBQ (I), checks CBQ offer to see whether overflow tone or RAN is provided and proceeds to Station Data Block.
 - b. If CBQ (A), proceeds to Route List.

Station Data Block

- 54a1. Checks to see if station has Ring Again.
- 54a2. If no, sends to intercept as BARS blocked call (NBLK).
- 54a3. If yes, continues.
- 54a4. Checks to see if Ring Again is active.
- 54a5. If no, continues (Step 55).
- 54a6. If yes, sent to intercept as BARS blocked call (NBLK).

Route List Data Block

- 54b1. Searches Extended Set for idle, eligible trunk.
- 54b2. If not found, checks CBQ offer and proceeds to Station Data (Step 55).
- 54b3. If found, checks DMI (Step 30), EXP (Step 33), and call completes (Step 38).

Station Data Block

- 55. CBQ is offered.
- 56. Station user either abandons call or activates Ring Again.
- 57. If station user activates Ring Again, call is placed in CBQ according to appropriate priority.

Network Control Data Block

- 58. Call continues through CBQ promotion schedule and route advance (SPRI, MPRI, PROM, RADT).

Route List Data Block

- 59. Trunk becomes available before RADT expires.
- 60. Performs digit manipulation as specified for the Route List entry.

Route Data Block

61. Seizes trunk.

Station Data Block

62. Notifies station user via Ring Again.
63. Network begins outpulsing at slow fixed rate.
64. Station user must respond within 6 seconds if a 500/2500 set.
65. Station user must respond within CBTL if a multi-line set.
66. If station user does respond, outpulsing assumes normal rate and call completes.
67. If station user does not respond, call is abandoned after allowable time limit.

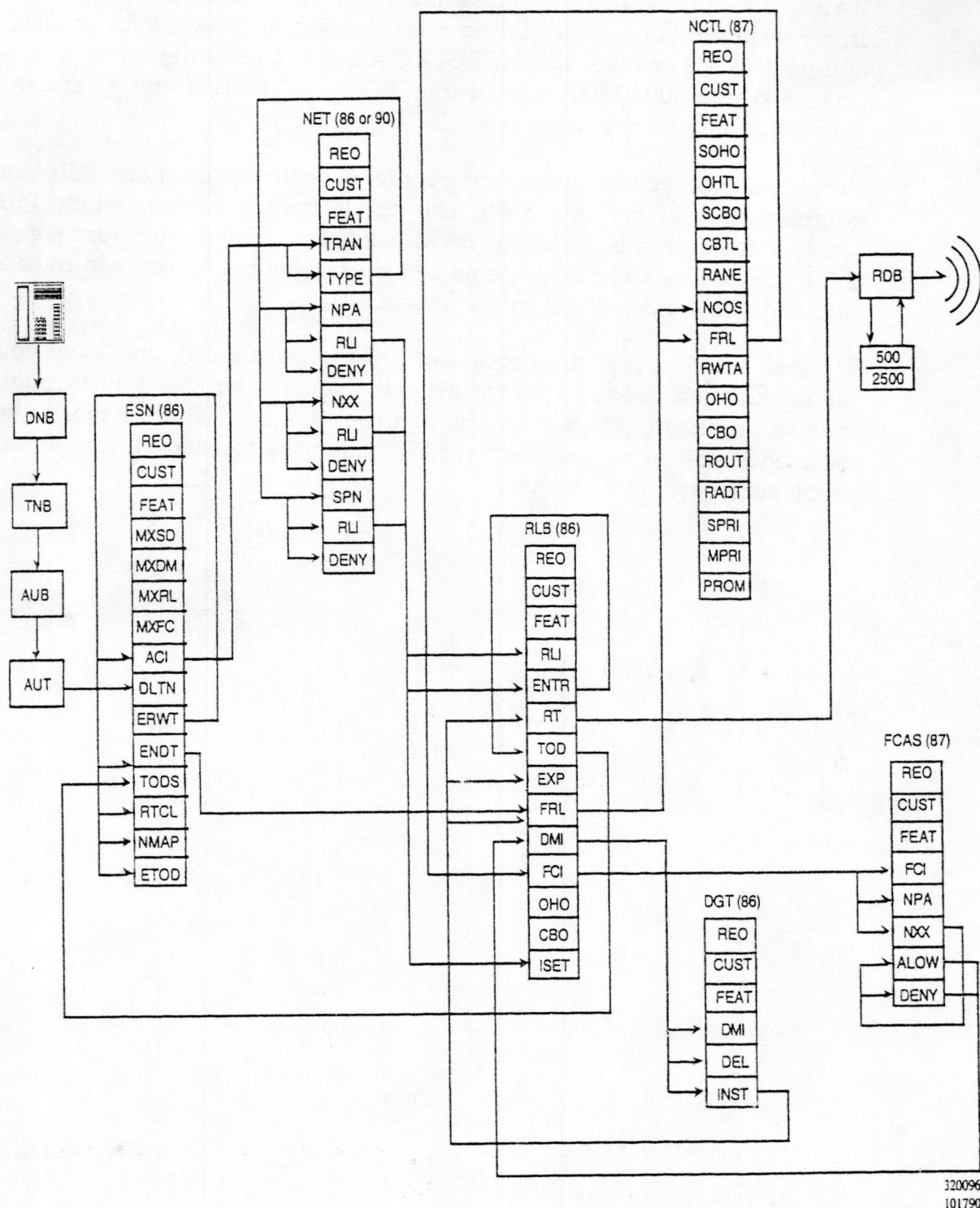
Route List Data Block

68. No trunk becomes available before RADT expires.
69. Network searches Extended Set for an idle, eligible trunk.
 - If none are eligible, call remains in queue on ISET.
 - If idle, eligible trunk found, proceeds to Step 62.

Note: If no entries are eligible due to TOD, FRL, FCI or COS, the call is blocked and sent to intercept as a BARS blocked call (NBLK).

Call Processing Chart
Figure 1

Simplified Call Processing



320096
101790

SUMMARY

Call Tracing is a program that provides a mean of tracing a call by looking at a snap shot of the transient data associated with the call. There are two print routines associated with tracing a call through BARS. These print routines make the software flexible to the situation. If, for instance, you would like to print the NCOS, TGAR, CLS or OHQ assigned to Tie trunks, the NCOS, TGAR and CLS assigned to multi-line sets and 500/2500 sets or the RTC assigned to the attendant consoles, you would load overlay 20.

When a customer has consistent problems with one or more calls not completing, you can trace the call to determine where, when and whether the call is blocking in BARS software. This is the purpose of call tracing. There are three items you must have before you can trace a call, and this was outlined in the lesson.

We took you through the process of how to trace a call, and gave you the information needed to trace the call. Finally, we took you through the call processing steps. As you can see, this is a valuable tool to be used once you have installed a BARS database to check for reported problems regarding blockage.

MODULE 19

IMPLEMENTING A NEW BARS DATABASE

INTRODUCTION

This lesson contains the information you will need to secure the database information from a customer, and a customer's scenario that encompasses building a BARS database to include the BARS features of RLB, FCAS, DGT, NCTL, CBQ, ITGE, TOD, RTCL, NET, and SDRR.

The exercise on the following pages will provide you with an opportunity to practice conducting a customer interview in preparation for developing a BARS database.

The structure of the exercise is informal. At the top of each page is a title indicating an area of discussion (Facilities, users, queueing, miscellany). You are directed to ask specific questions regarding each topic of discussion. Questions should be phrased in laymen's terms, exactly as they would during a customer interview. Each page in the student guide contains space to write notes and record questions to ask. The right-hand margin of each page contains a checklist of BARS-related features. At the conclusion of each discussion, you are asked to place an X next to each feature for which the database might be prepared as a result of the discussion. The customer information is provided for this exercise.

RECORDING INFORMATION WORKSHEETS

FACILITIES

- ☐ System Speed Call
- ☐ Access Code
- ☐ Dialing Format
- ☐ Translation Table
- ☐ SDRR-DENY
- ☐ SDRR-LDID
- ☐ SDRR-LDDD
- ☐ SDRR-ITED
- ☐ Route Lists
- ☐ Time of Day Schedules
- ☐ Digit Manipulation
- ☐ Free Calling Area Screening
- ☐ Network Class of Service/FRL
- ☐ Expensive Route Warning Tone
- ☐ Routing Control
- ☐ Call Back Queuing
- ☐ Off-Hook Queuing
- ☐ Authorization Codes
- ☐ Network Traffic Reports
- ☐ Intercept Treatment
- ☐ Attendant NCOS
- ☐ NCOS/CLS Assignments on
Sets/TIE Trunks
- ☐ Dial Tone Option
- ☐ TGAR/TARG
- ☐ DISA (CLS/NCOS)
- ☐ Tenant Service - Tenant to
Route Access
- ☐ Code Restriction
- ☐ Flexible Code Restriction

USERS

- ___ System Speed Call
- ___ Access Code
- ___ Dialing Format
- ___ Translation Table
- ___ SDRR-DENY
- ___ SDRR-LDID
- ___ SDRR-LDDD
- ___ SDRR-ITED
- ___ Route Lists
- ___ Time of Day Schedules
- ___ Digit Manipulation
- ___ Free Calling Area Screening
- ___ Network Class of Service/FRL
- ___ Expensive Route Warning Tone
- ___ Routing Control
- ___ Call Back Queuing
- ___ Off-Hook Queuing
- ___ Authorization Codes
- ___ Network Traffic Reports
- ___ Intercept Treatment
- ___ Attendant NCOS
- ___ NCOS/CLS Assignments on
Sets/TIE Trunks
- ___ Dial Tone Option
- ___ TGAR/TARG
- ___ DISA (CLS/NCOS)
- ___ Tenant Service - Tenant to
Route Access
- ___ Code Restriction
- ___ Flexible Code Restriction

QUEUING

- ___ System Speed Call
- ___ Access Code
- ___ Dialing Format
- ___ Translation Table
- ___ SDRR-DENY
- ___ SDRR-LDID
- ___ SDRR-LDDD
- ___ SDRR-ITED
- ___ Route Lists
- ___ Time of Day Schedules
- ___ Digit Manipulation
- ___ Free Calling Area Screening
- ___ Network Class of Service/FRL
- ___ Expensive Route Warning Tone
- ___ Routing Control
- ___ Call Back Queuing
- ___ Off-Hook Queuing
- ___ Authorization Codes
- ___ Network Traffic Reports
- ___ Intercept Treatment
- ___ Attendant NCOS
- ___ NCOS/CLS Assignments on
Sets/TIE Trunks
- ___ Dial Tone Option
- ___ TGAR/TARG
- ___ DISA (CLS/NCOS)
- ___ Tenant Service - Tenant to
Route Access
- ___ Code Restriction
- ___ Flexible Code Restriction

MISCELLANY

- _____ System Speed Call
- _____ Access Code
- _____ Dialing Format
- _____ Translation Table
- _____ SDRR-DENY
- _____ SDRR-LDID
- _____ SDRR-LDDD
- _____ SDRR-ITED
- _____ Route Lists
- _____ Time of Day Schedules
- _____ Digit Manipulation
- _____ Free Calling Area Screening
- _____ Network Class of Service/FRL
- _____ Expensive Route Warning Tone
- _____ Routing Control
- _____ Call Back Queuing
- _____ Off-Hook Queuing
- _____ Authorization Codes
- _____ Network Traffic Reports
- _____ Intercept Treatment
- _____ Attendant NCOS
- _____ NCOS/CLS Assignments on
Sets/TIE Trunks
- _____ Dial Tone Option
- _____ TGAR/TARG
- _____ DISA (CLS/NCOS)
- _____ Tenant Service - Tenant to
Route Access
- _____ Code Restriction
- _____ Flexible Code Restriction

RECORDING INFORMATION ON WORKSHEETS

The recommended order for filling out worksheets for a new customer is:

- Complete the Customer Data Block, Overlay 15 (excluding BARS information).
- Complete the Route Data Block, Overlay 16 (excluding BARS information).
- Complete the Trunk Data Block, Overlay 14 (excluding BARS information).
- Complete the Attendant Data Block, Overlay 12 (excluding BARS information).
- Complete the Meridian 1 set Data Block, Overlay 11 (excluding BARS information).
- Complete the 500/2500 set Data Block, Overlay 10 (excluding BARS information).
- Complete the DISA Data Block, Overlay 24.
- Determine the route lists required.
- Record the following prompts on the Route List Data Block, Overlay 86: RLI, ENTR, ROUT, EXP, ISET.
- Determine Digit Manipulation tables needed.
- Complete the Digit Manipulation Data Block, Overlay 86.
- Record Digit Manipulation indexes on the Route List Data Block, Overlay 86.
- Determine Time of Day Schedules on the ESN Data Block, Overlay 86.
- Record Time of Day Schedules number on the Route List Block, Overlay 86.
- Determine the Free Calling Area Screening Tables.
- Complete the Free Calling Area Screening Tables ,Overlay 87.

- Record Free Calling Area Indexes on the Route List Data Block, Overlay 86.
- Determine NCOS levels needed.
- Record the following prompts on the Network Control Data Block, Overlay 87: NCOS, FRL.
- Record FRLs on the Route List Data Block, Overlay 86.
- Assign the attendant's NCOS level in the Customer Data Block, Overlay 15.
- Assigning NCOS levels to Digital/Multiline Sets in Overlay 11 and analog sets in Overlay 10.
- Assign NCOS levels to incoming trunks in the Trunk Data Block, Overlay 14.
- Assign NCOS levels in the DISA Data Block, Overlay 24.
- Complete the Network Translation Data Block, Overlay 90.
- Complete the AUB and AUT Data Blocks, Overlay 88.
- Determine Queuing needed.
- Complete the Network Control Data Block, Overlay 87.
- Complete the Route List Data Block, Overlay 86.
- Allow incoming TIE calls to access Queuing in the Route Data Block, Overlay 16.
- Assign Off-Hook Queue Threshold to outgoing Routes in the Route Data Block, Overlay 16.
- Determine Incoming Trunk Group Exclusion Indexes required.
- Complete the ITGE Data Block, Overlay 86.
- Assign ITEDs and ITEI to Network Translation Tables, Overlay 90.
- Complete the ESN Data Block, Overlay 86.

RECOMMENDED ORDER FOR WORKSHEETS

The recommended order for filling out BARS worksheets for an existing customer is:

- Determine the Route Lists required.
- Record the following prompts on the Route List Data Block, Overlay 86: RLI, ENTR, ROUT, EXP, ISET.
- Determine Digit Manipulation Tables needed.
- Complete the Digit Manipulation Data Block, Overlay 86.
- Record Digit Manipulation indexes on the Route List Data Block, Overlay 86.
- Determine Time of Day Schedules on the ESN Data Block, Overlay 86.
- Record Time of Day Schedules number on the Route List Block, Overlay 86.
- Determine the Free Calling Area Screening Tables.
- Complete the Free Calling Area Screening Tables, Overlay 87.
- Record Free Calling Area Indexes on the Route List Data Block, Overlay 86.
- Determine NCOS levels needed.
- Record the following prompts on the Network Control Data Block, Overlay 87: NCOS, FRL.
- Record FRLs on the Route List Data Block, Overlay 86.
- Assign the attendant's NCOS level in the Customer Data Block, Overlay 15.
- Assign the NCOS level to Digital/Multiline Sets in Overlay 11 and to analog sets in Overlay 10.
- Assign NCOS levels to incoming trunks in the Trunk Data Block, Overlay 14.
- Assign NCOS levels in the DISA Data Block, Overlay 24.
- Complete the Network Translation Data Block, Overlay 90.

- Complete the AUB and AUT Data Blocks, Overlay 88.
- Determine Queuing needed.
- Complete the Network Control Data Block, Overlay 87.
- Complete the Route List Data Block, Overlay 86.
- Allow incoming TIE calls to access Queuing in the Route Data Block, Overlay 16.
- Assign Off-Hook Queue Threshold to outgoing Routes in the Route Data Block, Overlay 16.
- Determine Incoming Trunk Group Exclusion Indexes required.
- Complete the ITGE Data Block, Overlay 86.
- Assign ITED and ITEI to Network Translation Tables, Overlay 90.
- Complete the ESN Data Block, Overlay 86.

MERIDIAN 1 ENTRY ORDER

Information on overlay forms and worksheets is entered in the following order for an existing customer.

- ESN Data Block, Overlay 86.
- DGT Data Block, Overlay 86.
- FCAS Data Block, Overlay 87.
- NCTL Data Block, Overlay 87.
- RDB Data Block, Overlay 16.
- Trunk Data Block, Overlay 14.
- RLB Data Block, Overlay 86.
- ITGE Data Block, Overlay 86.
- NET Data Block, Overlay 90.
- CFN Data Block, Overlay 17.
- CDB Data Block, Overlay 15.
- 500/2500 Set Data Block, Overlay 10.
- Meridian 1 Set Data Block, Overlay 11.
- DISA Data Block, Overlay 24.
- Attendant Data Block, Overlay 12.
- AUB/AUT Data Blocks, Overlay 88.

When programming BARS for a new customer, information is entered into the network in the following order:

- CFN Data Block, Overlay 17.
- CDB Data Block, Overlay 15.
- RDB Data Block, Overlay 16.
- TRK Data Block, Overlay 14.
- ATT Data Block, Overlay 12.
- ESN Data Block, Overlay 86.
- DGT Data Block, Overlay 86.
- FCAS Data Block, Overlay 87.
- RLB Data Block, Overlay 86.
- ITGE Data Block, Overlay 86.
- NET Data Block, Overlay 90.
- 500 Set Data Block, Overlay 10.
- Meridian 1 Set Data Block, Overlay 11.
- AUB Data Block, Overlay 88.
- AUT Data Block, Overlay 88.
- DISA Data Block, Overlay 24.

BARS FINAL PRACTICAL

Customer 10 is adding BARS to their existing switch. Their routing requirements are the following:

- 1. BARS will be accessed by dialing 9.
- 2. Calls within their own area code will be made by dialing 7 digits.
- 3. Calls outside their own area code will be made by dialing 1 + NPA + 7 digits.
- 4. They have the following outgoing facilities:

Route 0 - COTS

Route 1 - T1 Span to MCI: (The T1 span covers everything but local and free calls including international dialing. It will be the first choice out for all calls except area codes that are served by a Tie or FEX route.)

Route 2 - Band 8 WATS :The Band 8 WATS covers the Southern California NPAs. (213,310, 818, 909, 805, 619)

Route 3 - Band 9 WATS : The Band 9 WATS covers the Northern California NPAs. (415, 510, 916, 707, 408, 209)

Route 4 - Tie route to San Francisco office (415 area code): The Tie route to San Francisco will cover all calls to the 415 area code.

Route 5 - Foreign Exchange route to Los Angeles (213 area code) : The Foreign Exchange to Los Angeles will cover only the NXXs that are local to it. (660, 852, 322, 220-259)

- 5. The COTS should be last choice for all calls except calls to local NXXs and any other free calls (911,1800,411) and will be classified as expensive and in the ESET.

- 6. Long distance information (NPA + 555-1212) can be routed over any facility.
- 7. 976 calls will be denied in all area codes.
- 8. The BARS will be programmed to recognize the customer's own main listed number and DID ranges. (Main #: 670-1100. DID range: 642-2500-2799.)
- 9. Calls that are routed over the San Francisco tie route must have the BARS access code of the S.F. switch inserted. (9)
- 10. Customer 10's home area code is 714. It does not need to be used for intra-area code calls, but make sure that if it is dialed, the call will still be routed.
- 11. The access restrictions are as follows:
 - NCOS 0 - Local NXXs only. (670, 671, 673, 674, 675, 640, 641, 642, plus 411, 911, and 1800.)
 - NCOS 1 - Long distance NXXs (840, 841, 842, 843, 844, 845) over any facility. Provide expensive route warning tone if call completes over the ESET.
 - NCOS 2 - Southern California NPAs, over any facility. Provide expensive route warning tone if call completes over the ESET.
 - NCOS 3 - Northern California NPAs, over any facility. Provide expensive route warning tone if call completes over the ESET.
 - NCOS 4 - USA NPAs (212, 312, 313, 708, 718, 201) over any facility. Provide expensive route warning tone if call completes over the ESET.
 - NCOS 5 - 0+ dialing, over any facility. Provide expensive route warning tone if call completes over the ESET.
- 12. Call back queuing allowed for all NCOS groups if they cannot complete on the ESET. Everyone enters the CBQ at a priority 3, and can look at the ESET again after 30 seconds.
- 13. Routing control will be enabled between the hours of 7pm and 7am. Everyone with the exception of NCOS 5 users will be restricted to local calling only during these hours.

MODULE 20

BARS CALL FLOW

1. User dials BARS ACOD, enters BARS call processing.

(LD 86)

FEAT ESN

AC1 1 or 2 digit number

2. System checks Network Translation for next digits dialed.

(LD 90)

FEAT NET

TYPE SPN (1-11 digits)

NXX (3-8 digits)

NPA (3-11 digits)

HNPA (3 or 4 digits)

3. If digits are not found, call is routed to Intercept treatment.

(LD 15) (RLS 20 and EARLIER)

TYPE CDB

INTR YES

NITR OVF OVF OVF ATN

(LD 15) (RLS 21 and LATER)

TYPE INT

NITR OVF OVF OVF ATN

4. If digits are found, the system checks for supplemental digit restriction on the subsequent digits dialed.

(LD 90)

FEAT NET

TYPE SPN, NXX, NPA

SDRR DENY

DENY SPN 1-10 digits

NXX 1-4 digits

NPA 1-7 digits

5. If the subsequent digits are denied, the call is routed to Intercept treatment.

(LD 15) (RLS 20 and earlier)

TYPE CDB

INTR YES

NRES OVF OVF OVF ATN

(LD 15) (RLS 21 and LATER)

TYPE INT

NRES OVF OVF OVF ATN

6. If the digits are not denied, the system check for supplemental digit recognition on the subsequent digits dialed.

(LD 90)

FEAT NET

TYPE SPN, NXX, NPA

SDRR	LDDD/LDID
LDDD/	
LDID	SPN 1-10 digits
	NXX 1-4 digits
	NPA 1-7 digits

6a. If the digits are recognized as LDID, the call is routed internally to the extension.

6b. If the digits are recognized as LDDD, the call is routed to the ATDN as specified in LD 15, Customer Data Block.

7. If the call is originating on a Tie trunk, the system checks for ITEI and ITED. If the digits dialed are listed as ITEDs and the call is originating on a tie route that is referenced in the ITEI, the call is blocked and sent to NRES. If there are no ITEDs but the call has originated on the tie route referenced in the ITEI, the call is blocked and sent to NRES.

(LD 86)

FEAT ITGE

ITEI	1-255
------	-------

RTNO	0-511
------	-------

(LD 90)

FEAT NET

TYPE	SPN, NXX, NPA
------	---------------

SDRR	ITED
------	------

ITED	SPN 1-10 digits
------	-----------------

NXX 1-4 digits

NPA 1-7 digits

ITEI (1-255)

If none of the subsequent digits are restricted or recognized, the call is pointed to the Route List Index.

8. At the RLI, the system notes the time and day the call is made, plus the NCOS of the call originator.

9. When the system notes the time and the day, it checks to see if Routing Control is in effect, to determine whether an alternate set of NCOS characteristics may have been established for the call originator.

(LD 86)

FEAT ESN

RTCL YES

This establishes that Routing Control has been enabled for the customer. Now, to see if Routing Control is in effect at the time the call is made, the call has to have originated either during hours that are defined in TOD Schedule 7;

TODS 7 sh sm eh em,

or at any time during a day flagged as an extended time of day period;

ETOD 1-7 (1=Sunday, 2=Monday, 3=Tuesday,
4=Wednesday, 5=Thursday, 6=Friday, and 7=
Saturday)

or the routing control key on the console has to be depressed. (LD 12)

KEY x (0-19) RTC.

If the call is made during any one of these situations, the system will reference the call originator's NCOS to the NMAP to see whether an alternate NCOS will be in effect for this call.

(LD 86)

FEAT ESN

NMAP X Y (X=Original NCOS, Y= Alternate NCOS)

Once Routing Control has been established, the system will proceed to the RLI where for every entry it will check:

10. Are there trunks available?

11. Are they available at this time of day?

(LD 86)

FEAT ESN

TODS a bb cc dd ee

FEAT RLB

ENTR 0-63

TOD X 0-7

12. Is there any additional screening occurring on the dialed number?
(Applies only to calls dialed in the format of 1+NPA)

(LD 87)

FEAT FCAS

FCI 1-255

NPA XXX

NXX ALLOW/DENY

ALLOW/

DENY The NXXs that you are allowing or denying

(LD 86)

FEAT RLB

ENTR 0-63

FCI 1-255

13. Does the NCOS (original NCOS or alternate NCOS if routing control is in effect) of the call originator have an FRL high enough to give them access to the entry on the RLI?

(LD 87)

FEAT NCTL

NCOS 0-99

FRL 0-7

(LD 86)

FEAT RLB

ENTR 0-63

FRL 0-7

The FRL of the call originator's NCOS must be equal to or greater than the FRL on the RLI entry.

14. If the call is blocked because of any of the four above reasons, the system searches the next entry, until the call completes, queuing is offered, or the call goes to intercept treatment NBLK.

(LD 15) (RLS 20 and EARLIER)

TYPE CDB

INTR YES

NBLK OVF OVF OVF ATN

(LD 15) (RLS 21 and LATER)

TYPE INT

NBLK OVF OVF OVF ATN

15. If the system encounters no blocking, it will check for Expensive Route Warning Tone;

(LD 86)

FEAT ESN

ERWT YES

(LD 87)

FEAT NCTL

NCOS 0-99

RWTA YES

(LD 86)

FEAT RLB

EXP YES

ISSET Must not include expensive entry

and if the call passes all four eligibility tests, ERWT will be given.

16. If any of the tests fail, the system checks for Digit Manipulation,

(LD 86)

FEAT DGT

DMI 1-255

DEL 1-15 leading digits

INST up to 24 actual leading digits

and the call will complete.

